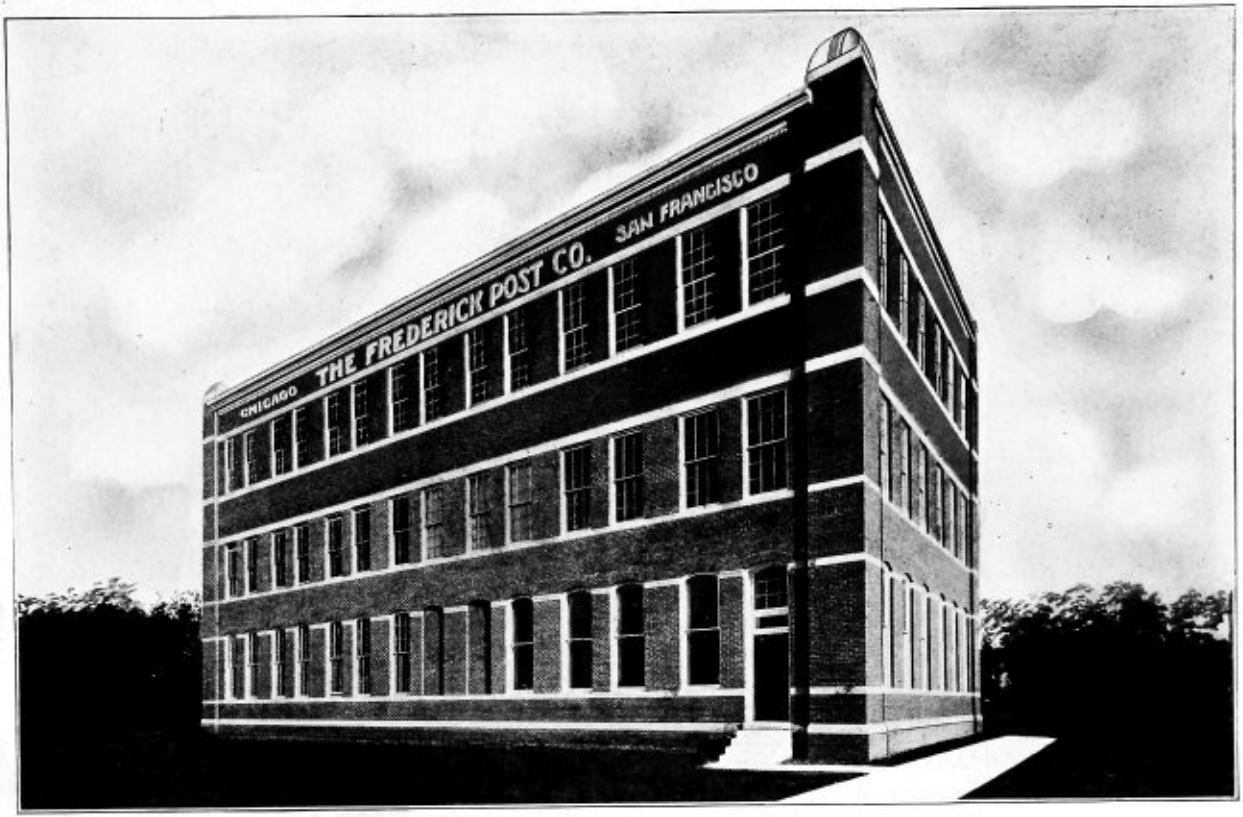
POST, FREDERICK CO

THE FREDERICK POST CO.

DRAWING MATERIALS

CHICAGO,
SAN FRANCISCO.



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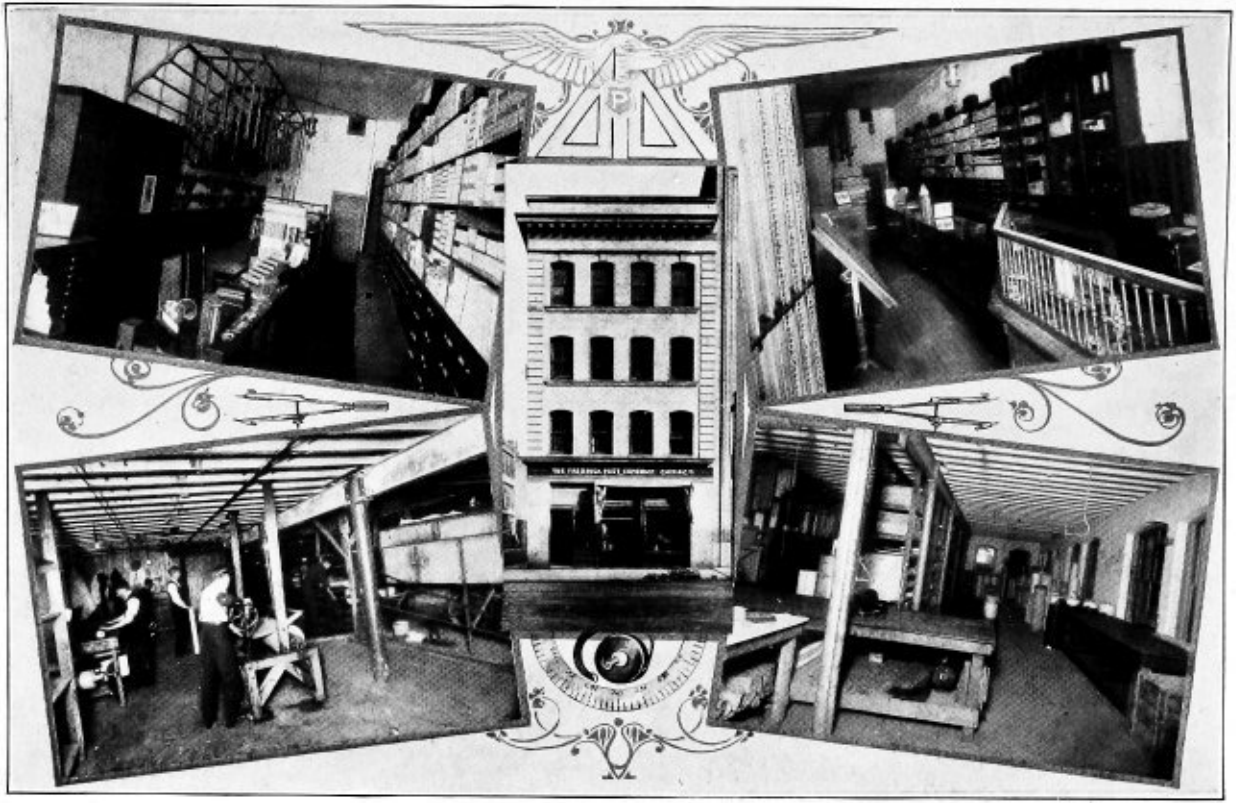

STORE AND WAREROOMS, SAN FRANCISCO

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1910 1911

Catalogue and Price List of The Frederick Post Company

MANUFACTURERS AND IMPORTERS OF

DRAWING MATERIALS AND MATHEMATICAL INSTRUMENTS

THE F. POST CO. CHICAGO & SAN FRANCISCO
TRADE MARK

CHICAGO
CITY OFFICE, 214-218 SO. CLARK ST.

FACTORY AND GENERAL OFFICES
IRVING PARK

SAN FRANCISCO
135 2ND STREET

Tenth Edition Price 50 Cents

4004

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THE FREDERICK POST CO.
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Washington.

PREFACE

We take great pleasure in presenting this, the tenth edition of our catalogue to our patrons and hope that it will be accorded a reception equally as kind as our former edition.

At the same time we take occasion to express our thanks for the kind patronage our friends have given us, and, as heretofore, it shall be our aim in the future to retain the interest of those who have helped us to increase our business, and to add to our long list of satisfied patrons, by not only maintaining the same standard of reliability which our goods have enjoyed heretofore, but by unceasing endeavor to improve their quality wherever this is possible.

Our motto mentioned in the preface to the last edition of our catalogue, that a pleased customer is the best advertisement, combined with our policy of absolute fairness and square and honest dealing, to which we always strictly adhere, has brought us success in so large a measure that our quarters were not large enough for our requirements and we are now building an addition to our factory at Hamlin and Avondale Aves. as large again as the main building.

For the accommodation of our Pacific Coast friends we have opened a branch at 135-137 Second Street, San Francisco, where we not only carry a full line of our goods but where we also maintain a fully equipped modern plant for preparing our well known blue and black print papers, so that we can fill all orders immediately from stock, which is always fresh.

Our policy of constant progress has made it necessary to make a number of important changes in this latest edition of our catalogue; new goods have been added and others which have become obsolete have been replaced with new and more up-to-date articles.

We believe that we have attained what we have set out to do, when making up this publication, that is, to list every article essential to our line, to give our friends a large variety of all the standard goods to select from, while at the same time we refrained from listing any articles which would simply tend to increase the bulk of our book without adding to its usefulness.

We can truthfully claim that all our goods are described accurately and we guarantee them to be so. We state this for the information of those who as yet are not acquainted with us and respectfully ask their critical inspection of our line when they are in the market.

It has been our aim to list only goods of first class workmanship and material rather than low priced articles, but we have made our prices as low as compatible with high quality and we express the hope that by adhering to our policy of giving prompt attention to the wants of our patrons and by carefully executing their orders we shall maintain their friendship and patronage as before.

THE FREDERICK POST COMPANY

Chicago, 1910

NOTICE

This 10th Edition of our Catalogue supersedes all previous Editions

HOW TO ORDER

Give the catalogue number and price of the article and in some instances, **Sub-Number, Size, Width, Thickness, Color, Name,** etc. Omitting any of these important particulars will often cause delay in shipping your order.

SHIPPING INSTRUCTIONS

State whether you wish your goods shipped by **express** or **freight,** and in either case designate the route. If packages weighing less than fifty pounds be forwarded by express you will find it safer, more convenient and equally as cheap as by **freight.** Articles weighing less than one pound can be sent by express, prepaid, or by **mail** at one cent per ounce, such charges being added to the price of the goods.

We will not be responsible for goods lost or damaged when sent by mail.

Registering mail matter lessens the risk of loss.

We ship goods according to our own judgment when no shipping instructions are given.

We exercise every precaution and care in packing goods, and can not make any allowance for goods damaged in transit.

REMITTANCES

Remittances may be made either by **bank draft,** payable to our order, **Post-office money order** or **express money order.** If goods are ordered by express C. O. D., a **remittance** should be sent with order, sufficient to cover **express charges both ways** in case of non-acceptance. Collection charges can be saved and goods delivered more promptly by remitting in full with order. If cash is sent by mail, the letter should be registered.

NEW ACCOUNTS

Those who never have had an account with us and wish to order goods, to insure prompt attention, will send **first-class references** or **remittance with order.** Failing to send the required references compels us to delay shipment while making necessary inquiries regarding the party ordering. We mention this because even important new enterprises are frequently not listed in the reference books.

REMARKS

We require **payment in advance** for any special articles made to order.

We request prompt complaint when any of our goods do not prove satisfactory, and such complaints will receive our **immediate attention** in order to please our patrons in every manner and in such a way sustain the **excellent reputation** which we now enjoy.

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

GENERAL OFFICE, FACTORY

DRAWING PAPERS IN SHEETS

Each package of our drawing papers in sheets bears our label with trade mark, and each sheet is stamped:

(Reduced facsimile of our label)

No. 1. **"BOND PAPER"** For tracing. Very tough.

Royal	19 × 24 inches	Per quire,	$0 95
Super Royal	19 × 30 "	"	1 05
Imperial	22 × 28 "	"	1 20
Double Elephant	27 × 40 "	"	2 00

No. 3. **"TEUTONIC"** Finest White Drawing Paper. For further description see page 15, No. 45.

Royal	19 × 24 inches	Per quire,	$0 90
Imperial	22 × 30 "	"	1 20
Atlas	24 × 36 "	"	2 00
Double Elephant	27 × 40 "	"	2 25

No. 4. **"SUPERB"** A pure white Drawing Paper. For further description see page 16, No. 48.

Royal	19 × 24 inches	Per quire,	$1 00
Imperial	22 × 30 "	"	1 80
Double Elephant	27 × 40 "	"	3 50

No. 5. **"CLASSIC"** German White Drawing Paper. Slightly grained surface. Well adapted for pencil, crayon, water color and ink. Very suitable for school use.

		Per Ream	Per Quire
Cap	14 × 17 inches	$ 3 85	$0 20
Demy	15 × 20 "	6 00	35
Medium	17 × 22 "	8 15	45
Royal	19 × 24 "	10 65	55
Super Royal	19 × 27 "	12 00	65
Imperial	22 × 30 "	14 90	95
Double Elephant	27 × 40 "	28 80	1 80

Samples of sheet papers mailed on application, or complete Sample Book for 20 cents

DRAWING PAPER IN SHEETS —Continued

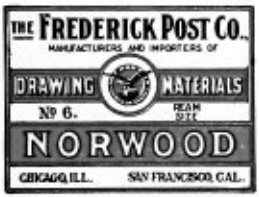
No. 5A. **"SCHOOL"** Drawing Paper. A low price white paper for School use. Only carried in stock in the following sizes:

Outside of these papers, listed below, we carry a complete stock of various school papers and respectfully solicit your inquiries.

	Per Quire	Per Ream
9 × 9 inches	$0 06	$0 80
9 × 12 "	10	1 50
12 × 18 "	20	3 00
18 × 24 "	40	6 00
24 × 36 "	80	12 00

No. 5B. **"DUTCH"** Drawing Paper. White. For School use.

6 × 9 inches	Per Ream,	$0 50
9 × 12 "	"	1 00
12 × 18 "	"	2 00
18 × 24 "	"	4 00
24 × 36 "	"	8 00



(Reduced facsimile of our label)

Each sheet is stamped:

No. 6. **"NORWOOD"** Drawing Paper. A very tough pure white Drawing Paper having a smooth, hard surface. An excellent paper for fine drawings in ink or pencil.

Royal	19 × 24 inches	Per Quire,	$1 65
Imperial	22 × 30 "	"	2 35
Double Elephant	27 × 40 "	"	3 60

No. 7. **"CORONA"** Finest Cream Drawing Paper. Is tough and has a hard grained surface. For further description see page 14, No. 40.

Royal	19 × 24 inches	Per Quire,	$1 10
Imperial	22 × 30 "	"	1 50
Atlas	24 × 36 "	"	2 25
Double Elephant	27 × 40 "	"	2 60

No. 8. **"VULCAN"** Finest Buff Drawing Paper. Combines exceptional strength with good erasing qualities. For further description see page 15, No. 42.

Royal	19 × 24 inches	Per Quire,	$0 75
Imperial	22 × 30 "	"	1 25
Atlas	24 × 36 "	"	1 75
Double Elephant	27 × 40 "	"	2 00

Samples of roll papers mailed on application or complete Sample Book for 20 cents

DRAWING PAPER IN SHEETS —Continued

No. 9. **"WHATMAN'S" HAND MADE** Drawing Paper, with **H. P.** or **C. P.** Surface. **In ordering, please state size and surface wanted.**

Cap	13 × 17 inches	Per quire,	$0 60
Demy	15 × 20 "	"	90
Medium	17 × 22 "	"	1 35
Royal	19 × 24 "	"	1 65
Super Royal	19 × 27 "	"	2 10
Imperial	22 × 30 "	"	2 70
Atlas	26 × 34 "	"	4 00
Double Elephant	27 × 40 "	"	4 80
Antiquarian	31 × 53 "	Per sheet,	80

No. 10. **"WHATMAN'S" HAND MADE** Drawing Paper. **Rough.**

Royal	19 × 24 inches	Per quire,	$1 65
Imperial	22 × 30 "	"	2 70
Double Elephant	27 × 40 "	"	4 80

No. 11. **"WHATMAN'S" HAND MADE** Drawing Paper. **Extra Heavy.**

		Per quire	Per sheet
Imperial	22 × 30 inches, H. P. or C. P.	$ 6 70	$0 35
Double Elephant	27 × 40 " " " "	10 00	60

No. 12. **"STRATHMORE"** Drawing Paper. Thin, medium surface. For water color work.

	Per ream	Per quire
22 × 31 inches	$43 20	$2 50

No. 12B. **"STRATHMORE"** Drawing Paper. Thin, high surface.

	Per ream	Per quire
22 × 31 inches	$43 20	$2 50

No. 12C. **"STRATHMORE"** Drawing Paper. Thick. Medium surface.

	Per ream	Per quire
27 × 40 inches	$79 80	$4 75

No. 12D. **"STRATHMORE"** Drawing Paper. Thick. High surface.

	Per ream	Per quire
27 × 40 inches	$79 80	$4 75

Samples of roll papers mailed on application or complete Sample Book for 20 cents

F. P. CO.'S BRISTOL BOARDS

No. 13

EACH SHEET STAMPED

No. 13. **"PATENT OFFICE"** Bristol Boards, 3-Ply. Possesses all the requirements of the U. S. Patent Office. For pen and ink work and will stand erasing perfectly. Can be rolled without injury.

		Per gross	Per dozen
10 × 15 inches.	Plain	$ 6 00	$0 60
15 × 20 "	"	12 00	1 20
10 × 15 "	Printed	7 20	72

No. 14. **"SUPERB"** Bristol Board, 2-Ply. The best Bristol Board on the market. Hard surface and stands erasing and scratching to perfection. Used by illustrators for the finest pen work.
In sheets 22 × 28 inches.....Per dozen, $3 00

No. 15. **"SUPERB"** Bristol Board, 3-Ply. Same description as No. 14.
In sheets 22 × 28 inches.....Per dozen, $4 00

No. 16. **"REYNOLDS"** Bristol Board.

			2 Sheets	3 Sheets	4 Sheets
Cap	12½ × 15½ inches.	Per doz	$0 60	$0 90	$1 20
Demy	14½ × 18½ "	"	90	1 35	1 75
Medium	16½ × 20½ "	"	1 20	1 80	2 40
Royal	18½ × 22½ "	"	1 50	2 40	3 10
Imperial	21½ × 28½ "	"	....	4 70	6 00

No. 17. **"STRATHMORE"** 2-Sheet Drawing Board. Medium surface.

	Per 100 sheets	Per quire
14½ × 23 inches	$ 6 00	$1 80
23 × 29 "	12 00	3 60

No. 17A. **"STRATHMORE"** 2-Sheet Drawing Board. High surface.

	Per 100 sheets	Per quire
14½ × 23 inches	$ 6 00	$1 80
23 × 29 "	12 00	3 60

No. 18. **"STRATHMORE"** 3-Sheet Drawing Board. Medium surface.

	Per 100 sheets	Per quire
14½ × 23 inches	$ 9 00	$2 70
23 × 29 "	18 00	5 40

No. 18A. **"STRATHMORE"** 3-Sheet Drawing Board. High surface.

	Per 100 sheets	Per quire
14½ × 23 inches	$ 9 00	$2 70
23 × 29 "	18 00	5 40

Samples of sheet papers mailed on application or complete Sample Book for 20 cents

WATER COLOR AND CRAYON PAPERS AND BOARDS, MOUNTING BOARDS, ETC.

No. 19. **"STRATHMORE"** 4-Sheet Drawing Board. Medium surface.

	Per 100 sheets	Per quire
14½ × 23 inches	$12 00	$3 80
23 × 29 "	24 00	7 60

No. 19A. **"STRATHMORE"** 4-Sheet Drawing Board. High surface.

	Per 100 sheets	Per quire
14½ × 23 inches	$12 00	$3 80
23 × 29 "	24 00	7 60

No. 20. **"STRATHMORE"** 5-Sheet Drawing Board. Medium surface.

	Per 100 sheets	Per quire
14½ × 23 inches	$15 00	$4 80
23 × 29 "	30 00	9 60

No. 20A. **"STRATHMORE"** 5-Sheet Drawing Board. High surface.

	Per 100 sheets	Per quire
14½ × 23 inches	$15 00	$4 80
23 x 29 "	30.00	9 60

No. 21. **"STRATHMORE"** Illustration Board. Thin.

	Per 100 sheets	Per sheet
22 × 30 inches	$16 00	$0 25

No. 22. **"STRATHMORE"** Illustration Board. Heavy.

	Per 100 sheets	Per sheet
20 × 30 inches	$20 00	$0 30
22 × 28 "	24 00	35
30 × 40 "	40 00	50

No. 23. **Winsor & Newton's "MONOCHROME"** Illustration Board.

20 × 30 inches	Per sheet, $0 30
30 × 40 "	" 50

No. 24. **Post's Illustration Board.**

20 × 30 inches	Per sheet, $0 30
30 × 40 "	" 50

No. 25. **"CHARCOAL PAPER."** White.

Royal.....19 × 25 inches.....Per quire, $0 60

No. 26. **Michallet "CHARCOAL PAPER."** White.

Royal.....19 × 25 inches.....Per quire, $0 90

No. 28. **"MOUNTING"** and **"MAT"** Boards, in all colors and surfaces. These Boards are well adapted for the ornamental glass trade, being manufactured of superior stock and take a smooth bevel. Also adapted for mounting photographs and drawings.

Size, 30 × 40 inches.....Each, $0 25

Samples of sheet papers mailed on application, or complete Sample Book for 20 cents

DETAIL PAPERS IN ROLLS

No. 30. **"MANILA DETAIL"** Paper. Smooth Surface. Used by ornamental glass workers, pattern makers, etc., for stencils, etc.
In original rolls weighing about 100 pounds, in three thicknesses, **thin, medium** and **thick,** 36, 40 and 48 inches wide.....Per pound, $0 10

No. 31. **"STAR"** Ribbed Detail Paper. Cold Pressed. Of Manila stock, slightly ribbed surface. Will take a reasonable amount of erasing and is made for draughting purposes.
In rolls of about 100 pounds, 36, 42 and 48 in. wide.....Per pound, $0 12

36 inches wide, per 100 yards					$4 50	Per 50 yards					2 50
42	"	"	"	100	"	5 50	"	50	"		3 00
48	"	"	"	100	"	6 75	"	50	"		3 65
54	"	"	"	100	"	8 00	"	50	"		4 25

No. 31½. **"STAR"** Made of Manila stock. Has a slightly grained surface.
In original rolls of about 100 pounds.....Per pound, $0 12

36 inches wide, per 100 yards					$4 50	Per 50 yards					2 50
42	"	"	"	100	"	5 50	"	50	"		3 00
48	"	"	"	100	"	6 75	"	50	"		3 65
54	"	"	"	100	"	8 00	"	50	"		4 25

No. 32. **"LINCOLN"** Superior Detail Drawing Paper. **Thin.** Slightly grained surface. Manufactured of **selected rag stock.** Takes ink and pencil well and erases to perfection. Never gets brittle, **lies perfectly flat** on drawing table, and will stand the roughest handling.
In rolls 100 pounds, 36, 42, 48, 54 inches wide.....Per pound, $0 12

36 inches wide, per 100 yards					$4 00	Per 50 yards					2 25
42	"	"	"	100	"	4 50	"	50	"		2 50
48	"	"	"	100	"	5 25	"	50	"		2 90
54	"	"	"	100	"	6 00	"	50	"		3 25

No. 32. **"LINCOLN"** Superior Detail Drawing Paper. **Medium.**
In rolls 100 pounds, 36, 42, 48, 54 inches wide.....Per pound, $0 12

36 inches wide, per 100 yards					$4 50	Per 50 yards					2 50
42	"	"	"	100	"	5 50	"	50	"		3 00
48	"	"	"	100	"	6 75	"	50	"		3 65
54	"	"	"	100	"	8 00	"	50	"		4 25

No. 32. **"LINCOLN"** Superior Detail Drawing Paper. **Extra Thick.**
In rolls 100 pounds, 36, 42, 48, 54 inches wide.....Per pound, $0 12

36 inches wide, per 100 yards					$5 00	Per 50 yards					2 75
42	"	"	"	100	"	6 25	"	50	"		3 40
48	"	"	"	100	"	7 50	"	50	"		4 00
54	"	"	"	100	"	8 75	"	50	"		4 65

Samples of roll papers mailed upon application, or complete Sample Book for 20 cents

DRAWING PAPERS IN ROLLS —Continued

(Reduced facsimiles of our labels)

In our judgment, based on a long and varied experience with the draughting profession, we believe that drawing papers, to possess merit, must combine the following qualities to the highest degree, i. e.:

Erase perfectly. Take **ink** and **color** well. Lie **flat** on the drawing table and stand the **roughest usage.**

We can assure the trade that when they specify our **well-known brands,** that their requirements will be amply met with a highly satisfactory paper, and, furthermore, would state that the short descriptions we append to our various papers truthfully describe their qualities without exaggeration.

No. 40. **"CORONA"** Finest Cream Drawing Paper. Is the best grade of Cream Drawing Paper manufactured, is **tough,** never gets brittle, has a **hard grained surface,** takes ink and water-color equally well, stands erasing to perfection, its color permitting much handling without soiling.
In rolls of about 45 pounds, 24, 27, 36, 42, 54, 62 inches wide.
Per pound..... $0 33

	Per 100 yds.	50 yds.	25 yds.	10 yds.	Yard
24 inches wide	$ 7 00	$ 3 75	$2 00	$0 80	$0 08
27 " "	8 00	4 25	2 25	1 00	10
30 " "	9 00	5 00	2 75	1 25	13
36 " "	10 50	5 50	3 00	1 75	18
42 " "	14 25	7 50	4 00	2 00	20
54 " "	15 75	8 35	4 50	2 25	23
62 " "	18 50	10 00	5 50	2 50	25

Samples of roll papers mailed on application or complete Sample Book for 20 cents

DRAWING PAPERS IN ROLLS —Continued

(Reduced facsimiles of our labels.)

No. 42. **"VULCAN"** Finest Buff Drawing Paper. An **unequalled** combination of **strength** and fine **erasing qualities.** The tint is resting to the eye, and permits it to be roughly handled without soiling. Especially adapted for machine shops, etc.

In rolls of about 45 pounds, 24, 27, 36, 42, 54 and 62 inches wide.

Per pound.....$0 25

	Per 100 yds.	50 yds.	25 yds.	Yard
24 inches wide	$ 5 85	$3 20	$1 70	$0 07
27 " "	6 80	3 60	1 90	09
30 " "	7 45	3 95	2 15	11
36 " "	8 90	4 70	2 55	13
42 " "	12 10	6 40	3 40	17
54 " "	13 40	7 30	3 85	19
62 " "	15 00	8 00	4 25	25

No. 45. **"TEUTONIC"** Finest White Drawing Paper. A superior drawing paper suitable for wash drawings. Takes ink and pencil well. Same **selected** stock as No. 40.

In rolls of about 45 pounds, 27, 36, 42, 54, 62 inches wide....Per pound, $0 35

	Per 50 yds.	25 yds.	Yard
27 inches wide	$ 5 60	$3 00	$0 15
36 " "	7 50	4 00	20
42 " "	8 75	4 75	24
54 " "	13 25	6 40	30
62 " "	14 25	7 40	35

No. 46. **"CLASSIC"** German White Drawing Paper. Especially adapted for preliminary drawings and recommends itself for its low price.

In rolls of about 45 pounds, 36, 42, 54 inches wide.....Per pound, $0 25

	Per 100 yds.	50 yds.	25 yds.	Yard
36 inches wide	$10 50	$5 50	$3 00	$0 18
42 " "	14 25	7 50	4 00	20
54 " "	16 00	8 50	4 50	25

Samples of roll papers mailed upon application, or complete Sample Book for 20 cents

DRAWING PAPERS IN ROLLS —Continued

No. 48. **"SUPERB"** Finest Grade of White Drawing Paper. Of exceptional strength, purity of color and hardness of surface.

In rolls of about 45 pounds, 36 and 42 inches wide.....Per pound, $0 38

	Per 50 yds.	25 yds.	Yard
36 inches wide	$8 00	$4 50	$0 24
42 " "	9 25	5 25	28

No. 50. **"JUMBO"** Strongest Drawing Paper Made. **Thin.** For drawings subjected to **rough usage.** Will not break when folded.

In rolls of about 50 pounds, 36 and 42 inches wide.....Per pound, $0 40

	Per 25 yds.	10 yds.	Yard
36 inches wide	$4 75	$2 00	$0 25
42 " "	6 25	2 60	30

No. 51. **"JUMBO"** Strongest Drawing Paper Made. **Thick.**

In rolls of about 50 pounds, 31, 36, 62 inches wide.....Per pound, $0 40

	Per 25 yds.	10 yds.	Yard
31 inches wide	$ 7 50	$3 10	$0 33
36 " "	8 50	3 60	40
62 " "	10 50	4 65	50

No. 54. **"PRIMO EGGSHELL"** Drawing Paper. **Medium.** Manufactured from **selected linen stock,** fine pitted surface. For all kinds of finished drawings, pencil, ink, water-color and air-brush work.

In rolls of about 50 pounds, 36, 42, 58 inches wide.....Per pound, $0 45

	Per 25 yds.	10 yds.	Yard
36 inches wide	$ 7 50	$3 10	$0 33
42 " "	8 50	3 60	36
58 " "	10 50	4 65	47

No. 56. **"PRIMO EGGSHELL"** Drawing Paper. **Extra Heavy.** Same superior **linen stock** as No. 54 but **heavier.**

In rolls of about 50 pounds, 58 inches wide.....Per pound, $0 50

	Per 25 yds.	10 yds.	Yard
58 inches wide	$13 75	$5 90	$0 65

No. 60. **"PRIMO EGGSHELL"** Drawing Paper. **Medium Smooth.** Same high grade stock as No. 54 and 56 but smooth **cold pressed surface.**

In rolls of about 50 pounds, 36, 42, 58 inches wide.....Per pound, $0 45

	Per 25 yds.	10 yds.	Yard
36 inches wide	$ 7 50	$3 10	$0 33
42 " "	8 50	3 60	36
58 " "	10 50	4 65	47

Samples of roll papers mailed on application, or complete Sample Book for 20 cents

DRAWING AND SKETCHING PAPERS IN ROLLS

No. 62. **"BOND"** Drawing Paper. Is very **tough,** will stand **erasing** and is **transparent** enough to use for tracing. Generally used by surveyors, civil engineers and manufacturers. **Blue Prints** can be taken from drawings made on this paper. In rolls of 50 yards, 36 and 42 inches wide, also in original rolls of about 100 pounds.

36 inches wide.	Per roll of 50 yards	$4 25
42 " " " " "	50 "	4 90

No. 64. **"MONITOR"** Sketching and Tracing Paper. Will take ink and color perfectly. Can be used for tracing. **Blue Prints** can be taken from drawings made on this paper.

31 inches wide.	Per roll of 50 yards	$1 80
36 " " " " "	50 "	2 00
62 " " " " "	50 "	3 50

MOUNTED DRAWING PAPERS IN SHEETS

Our mounted papers are stretched and air dried.

Besides the sizes listed below, we furnish any sized sheets of our various papers, mounted to order, and mount maps in any style desired.

All mounted sheets furnished with muslin carefully trimmed to edges.

No. 70. **"WHATMAN'S"** Mounted.

19 × 24 inches.	Per sheet, select	$0 35
22 × 30 "	" " "	50
27 × 40 "	" " "	90
31 × 53 "	" " "	2 10
31 × 53 "	" " Retree	1 40

No. 71. **"WHATMAN'S"** Double Mounted for atlas work. Paper on both sides of muslin.

22 × 30 inches.	Per sheet	$0 85
27 × 40 "	" "	1 50

No. 72. **"PRIMO EGGSHELL"** Smooth surface, same stock as Nos. 54 and 60.

22 × 30 inches.	Per sheet	$0 45
27 × 40 "	" "	75

No. 73. **"PRIMO EGGSHELL"** Double Mounted.

22 × 30 inches.	Per sheet	$1 00
27 × 40 "	" "	1 50

Samples of mounted sheet papers on application, or complete Sample Book for 20 cents

MOUNTED DRAWING PAPERS IN ROLLS

(Reduced facsimiles of our labels.)

These papers are mounted on heavy muslin, and are especially adapted for **map work** or other drawings it is desired to preserve.

Our Mounted papers will not break if folded or handled and are **mounted perfectly smooth.**

No. 79. **"CORONA"** Mounted. The same papers as described under No. 40.

	Per 10 yds.	Yard
36 inches wide	$ 6 00	$0 70
42 " "	7 50	90
54 " "	9 00	1 00
62 " "	12 00	1 35

No. 81. **"TEUTONIC"** Mounted. The same paper as described under No. 45.

	Per 10 yds.	Yard
36 inches wide	$ 6 50	$0 80
42 " "	7 30	90
62 " "	12 00	1 45

No. 85. **"JUMBO"** Mounted. The same paper as described under No. 51.

	Per 10 yds.	Yard
36 inches wide	$ 8 85	$1 20
62 " "	13 25	1 60

No. 90. **"PRIMO EGGSHELL"** Medium. The same paper as described under No. 54.

	Per 10 yds.	Yard
36 inches wide	$ 7 85	$1 00
42 " "	8 85	1 10
58 " "	12 00	1 45

No. 91. **"PRIMO EGGSHELL"** Extra Heavy. **Mounted.** The same paper as described under No. 56.

	Per 10 yds.	Yard
58 inches wide	$13 00	$1 60

Samples of mounted papers mailed on application, or complete Sample Book for 20 cents

MOUNTED DRAWING PAPERS IN ROLLS —Continued

No. 95. **"PRIMO EGGSHELL" Smooth.** The same paper as described under No. 60.

	Per 10 yds	Yard
36 inches wide	$ 7 85	$1 00
42 " "	8 85	1 10
58 " "	12 00	1 45

No. 110. **"PAPER CLOTH" Pliable.** Strong and practically indestructible. Expressly made for draughting purposes, takes ink and pencil well, and erases perfectly.

36 inches wide.....Per yard, $0 50

ADHESIVE CLOTH AND PAPERS

No. 117. **POST'S GUMMED CLOTH**

In lengths of 10 yards, $\frac{7}{8}$ inches wide.....Per roll, $0 10

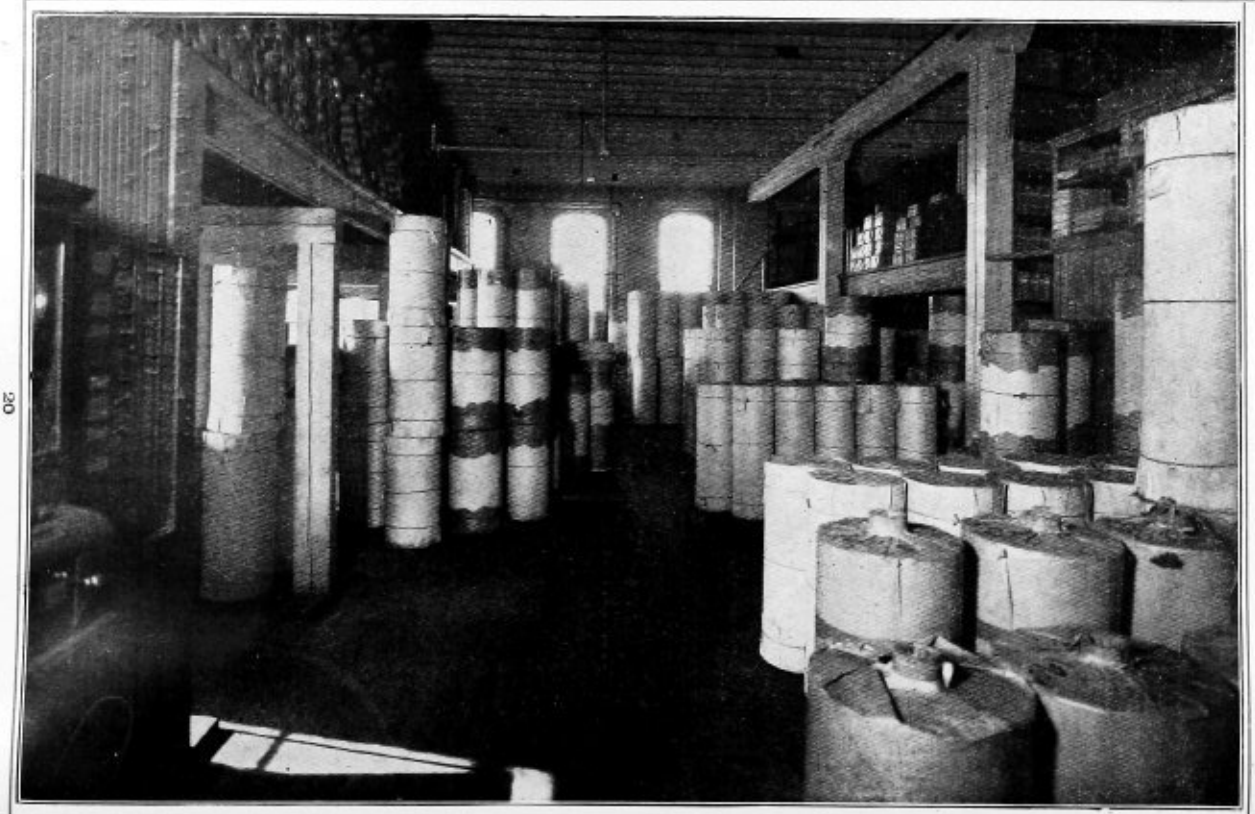
Made in red, light green, dark green, white, gray, blue, black, ecru, brown and maroon.

The strongest cloth tape for stretching drawings or mending blue prints and binding drawings or tracings.

No. 118. **FRENCH TRANSPARENT GUMMED PAPER**

On reels containing 6 yards, each.....$0 10
Per dozen..... 75

This paper will not blur or blot when written over and is perfectly transparent; very useful for repairing drawings or blue prints.



THE FREDERICK POST CO.

ONE OF OUR ORIGINAL ROLL PAPER LOFTS, FACTORY

TRACING CLOTH

NOT THE CHEAPEST BUT THE BEST.

No. 120.

No. 123.

A SATISFACTORY FABRIC AT A LOW PRICE.

The **"KOH-I-NOOR"** and **"MEPHISTO"** are L. & C. Hardtmuth's famous Tracing Cloths. **Like the "Koh-i-noor" Pencils, the finest produced.**

Free from pin holes—unequaled in transparency—erases perfectly. Endorsed by leading United States Government engineers, railroads, manufacturers, architects and civil engineers. We guarantee every roll and are direct importers.

The **"CORONA"** is an exceedingly fine tracing cloth, possessing all the qualities that a first grade cloth should and is made specially for us by one of the best known manufacturers.

PRICES:

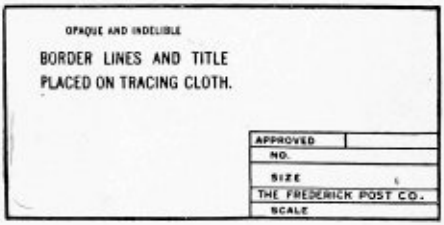
No. 120.	**"KOH-I-NOOR"** Tracing Cloth	30 in.	36 in.	42 in.	48 in.	54 in.
	Per roll of 24 yards	$8 10	$9 00	$12 10	$16 00	$17 00
No. 122.	**"CORONA"** Tracing Cloth.	30 in.	36 in.	42 in.	48 in.	54 in.
	Per roll of 24 yards	$8 10	$9 00	$12 10	$16 00	$17 00
No. 123.	**"MEPHISTO"** Tracing Cloth.	30 in.	36 in.	42 in.	48 in.	54 in.
	Per roll of 24 yards	$6 40	$7 40	$10 00	.....	.....
No. 125.	**"IMPERIAL"** Tracing Cloth.	30 in.	36 in.	42 in.	48 in.	54 in.
	Per roll of 24 yards	$8 10	$9 00	$12 10	$16 00	$17 00

Samples of tracing cloths mailed on application, or complete Sample Book for 20 cents

TRACING CLOTH IN SHEETS

On account of the large demand for tracing cloth cut in sheets, we have decided to list various sizes, which have become Standard, and keep them in stock for the convenience of our customers, so as to be able to fill any orders without delay.

We also make a specialty of furnishing tracing cloth in sheets with printed borders and titles in very opaque black ink, in style like or similar to illustration shown below.



The design of the illustration is not standard, most engineers preferring to order their own designs. The prices quoted below are applicable to any designs similar to the one shown above in the respective sizes.

No. 126. **TRACING CLOTH,** in sheets.

	Not Printed	Imprinted with Border and Title
Size 8 × 12, per 500 sheets.....	$16 25	$23 45
" 9 × 12, " 500 "	18 00	25 20
" 12 × 18, " 500 "	22 50	32 20
" 18 × 24, " 500 "	72 50	82 20
" 21 × 36, " 500 "	124 00	137 25
" 24 × 36, " 500 "	137 00	153 15
" 28 × 42, " 500 "	227 50	243 00
" 36 × 42, " 500 "	275 00	290 50

The Tracing Cloth in sheets is packed in packages of 500 sheets, the sheets are cut uniform and packed flat between stiff pasteboards, so that they will lie flat and smooth on the table when used.

Other sizes cut and printed to order

No. 131.

TRACING CLOTH POWDER

For powdering tracing linen
to make it take ink more readily.

No. 131. In Tin Shakers.....Each, $0 15

132. In Cakes..... " 20

"PRIMO" LIQUID TRACING CLOTH CLEANER

To remove pencil marks, grease spots or dirt, moisten the piece of flannel furnished with each bottle and rub the tracing cloth with it. The liquid will not remove waterproof ink. The tracing cloth will take ink readily after its application.

No. 133 . In 2-oz. Bottles.....Each, $0 35

"PRIMO" INK REMOVER

For erasing Black Waterproof Drawing Ink lines and figures without injury to the tracing cloth.

No. 134. In 1-oz. bottles.....Each, $0 30

134A. " 4-oz. " with sponge, cloths and directions for use..... " 80

No. 135B.

"PRIMO" TRANSPARENTIZING FLUID

No. 135.	"Primo" Transparentizing Fluid, per gallon	$3 00
135A.	" " " ½-gallon	2 00
135B.	" " " quart	1 50

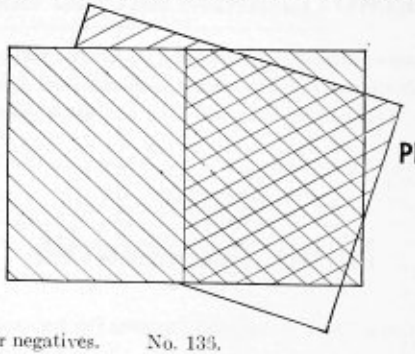
Directions with every package.

This solution when applied to old tracings will restore their transparency. If negatives or drawings on Bond Paper are treated with it, it will save 50 per cent. of the time in the blue print room.

The solution is non-inflammable, will not injure drawings or ink and is odorless.

"PRIMO" DIRECT COPIER FOR BLUE PRINTS

The "Primo" Direct Copier makes direct copies from blue prints. Formerly when it became necessary to make a print from a blue print a new tracing had to be made. The "Primo" Direct Copier does away with this. An old blue print treated with it gives perfect blue prints or negatives.



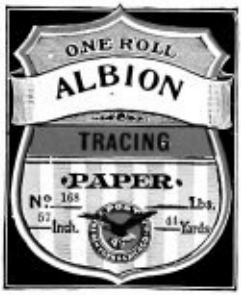
No. 133.

"PRIMO" Direct Copier.

No. 136. Outfit No. 1 consisting of:
1 8-oz. bottle of Concentrated Fluid No. 1,
1 pint " " " " " 2,
1 pint of "Primo" Transparentizing Fluid,
1 brush.
With full directions.....$3 50

No. 137. Outfit No. 2 consisting of:
1 pint of Concentrated Fluid No. 1,
1 quart " " " " 2,
1 quart " "Primo" Transparentizing Fluid,
1 brush.
With full directions.....$6 00

TRACING PAPERS IN SHEETS



(Reduced facsimiles of our labels.)

No. 140. **"VEGETABLE"** Tracing Paper. In sheets only. Has a fair strength. Very transparent. 24 sheets in a package.

Cap	13×17 inches	Per quire, $0 75
Royal	19×25 "	" " 2 00

No. 144. **"ECLIPSE"** Tracing Paper. Thin and very clear.

Royal	19×24 inches	Per quire, $1 00
Imperial	21×28 "	" " 1 25

TRACING PAPERS IN ROLLS

No. 160. **"DETAIL"** Tracing Paper. For tracing full size details, adapted to **pencil only.**

In rolls, 40 and 48 inches wide.

	Per 100 yds.	50 yds.
40 inches wide	$2 50	$1 50
48 " "	3 00	1 75

No. 161. **"DETAIL"** Tracing Paper. **White.** For tracing full size details, adapted to **pencil only.**

In rolls, 40 and 48 inches wide.

Per roll of	50 yards,	40 inches wide			$1 50
" "	50 "	48 "	"		1 75
" "	100 "	40 "	"		2 50
" "	100 "	48 "	"		3 00

No. 163. **"UNION"** Tracing Paper. **Unglazed.** Strongest Tracing Paper made. Will not tear in handling and retains its **white color.** Will not get brittle with age.

42 inches wide. Per roll of 20 yards $1 35

Samples of tracing papers mailed on application, or complete Sample Book for 20 cents

TRACING PAPERS IN ROLLS —Continued

No. 164. **"ECLIPSE"** Tracing Paper. **Thin.** A very transparent paper, takes ink perfectly and is especially adapted for use in tracing from blue prints.
42 inches wide. Per roll of 20 yards $1 50

No. 165. **"ECLIPSE"** Tracing Paper. **Medium.** Same paper as described under No. 164 but **heavier.**
Per roll of 20 yards, 42 inches wide $2 00

No. 166. **"IVORY"** Tracing Paper. **Thin.** Very transparent, smooth finish. White in color.
Per roll of 20 yards, 42 inches wide $1 50

No. 167. **"IVORY"** Tracing Paper. **Medium.** Same paper as described under No. 166 but heavier.
Per roll of 20 yards, 42 inches wide $2 00

No. 268. **"ALBION"** Tracing Paper. **Unglazed.** A thin, white, natural tracing paper, adapted for pen and ink perspectives In rolls of 22 yards and 44 yards, 42 and 57 inches wide.

Per roll of	22	yards,	42	inches wide	$1 90
" " "	44	"	42	" "	3 50
" " "	22	"	57	" "	2 00
" " "	44	"	57	" "	4 00

No. 172. **"IRVING"** Tracing Paper. Prepared, very transparent. Dull on one side for pencil drawings, glazed on other side for ink drawings.
42 inches wide. Per roll of 20 yards $2 50

No. 173. **"PARCHMENT"** Tracing Paper. **Medium.** Very strong and transparent. Will not shrink, and takes ink and water-color well.
Per roll of 20 yards, 37 inches wide $3 25

No. 174. **"PARCHMENT"** Tracing Paper. **Thick.** Same paper as described under No. 173 but **heavier.**
Per roll of 20 yards, 37 inches wide $3 75

Samples of tracing papers mailed on application, or complete Sample Book for 20 cents

TRACING PAPERS IN ROLLS —Continued

(Reduced facsimiles of our labels)

No. 175. **"IMPERIAL"** Tracing Paper. A good **substitute** for **tracing cloth.** Excellent for ink work. Very tough and transparent.

The only air dried tracing paper made. Surpasses all others in durability An excellent paper for making tracings which are to be preserved, as it will not deteriorate with age.

Per roll of 20 yards, 40 inches wide $3 75

No. 177. **"VELOUR"** Tracing Paper. **Waterproof.** A dull finish tracing paper of exceptional strength and transparency, takes ink and water-color without buckling, stands erasing perfectly.

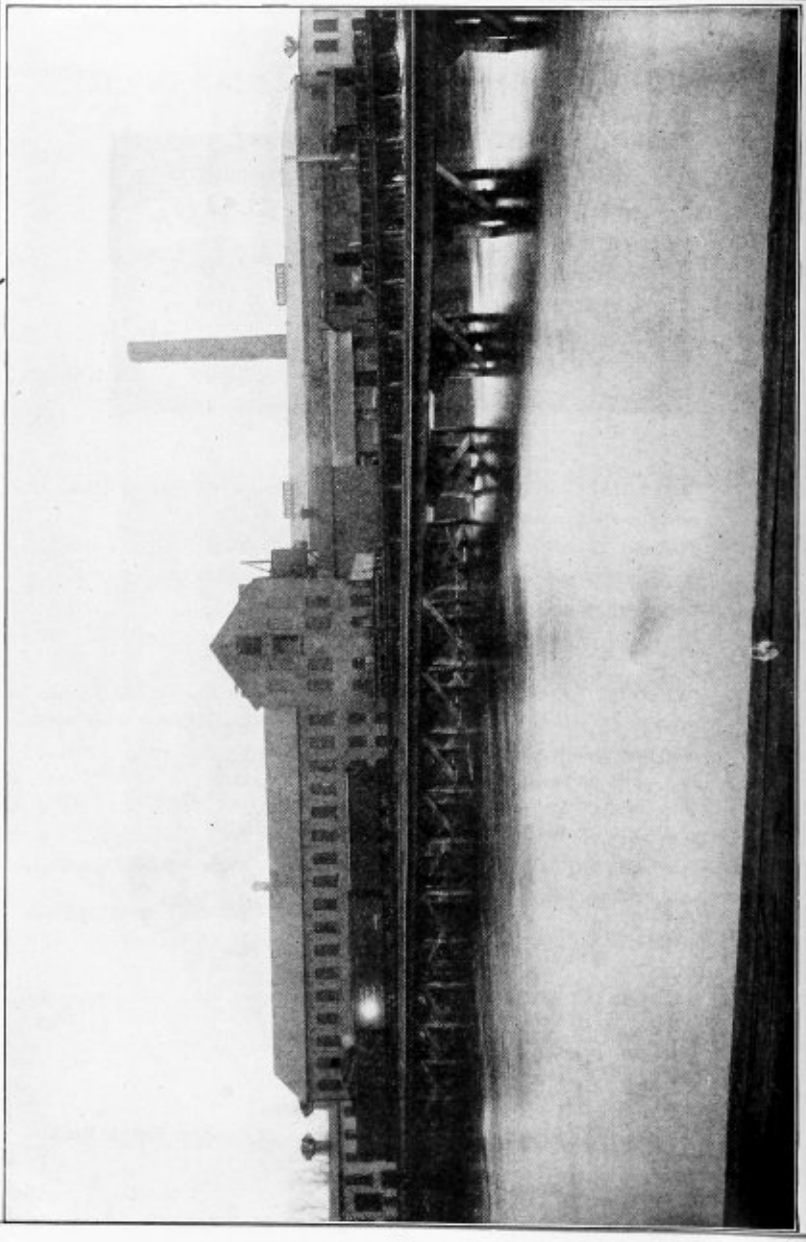
Per roll of 20 yards, 30 inches wide $3 50
" " " 20 " 36 " " 4 00
" " " 20 " 42 " " 4 50

For preserving "Imperial" and "Velour" Tracing Papers, strong pasteboard tubes can be furnished at 30 cents extra per tube.

METAL SCREW CAP PASTEBOARD TUBES

No. 178. **PASTEBOARD TUBE,** covered with glazed paper, with metal screw cap.
31 inches long ..... Each $0 20
37 " " ..... " 25
43 " " ..... " 30

Samples of tracing papers mailed upon application, or complete Sample Book for 20 cents



A VIEW OF OUR PAPER MILL.

PRIMO, STANDARD AND COMMERCIAL BLUE PROCESS PAPERS

In this edition of our catalogue we take extreme pleasure in showing photos of the mill where our commercial brands of blue print papers have been made for many years.

Our mill is beautifully located, has the natural advantages necessary for making a uniform product at all times, and we can truthfully claim that through our efforts we have to a large extent supplanted foreign papers with a good American product.

Our accomplishments have resulted in bringing the blue process papers on a commercially reasonable basis, allowing their use almost to an unlimited extent, on account of their greatly reduced cost, and we hope our patrons when placing their orders for this material will be kind enough to always bear this in mind.

Our consumption of these papers has assumed extraordinary proportions, equaling four carloads or 120,000 pounds per month.

The evolution in the history of blue print papers dating back to the most primitive methods used for coating papers, viz.. a common wooden table and sponge, applying the solution by hand, will now find us equipped with most up-to-date machinery.

Our success and rapid growth stands without comparison and is a positive proof that our patrons have been pleased and satisfied with our dealings and treatment.

Our Foreign Papers are of the finest quality obtainable, made by a well known mill, whose excellent reputation alone vouches for the high quality of its product.

Our Blue Print Papers are made in three different grades, i. e., the stock of paper is different. The sensitizing solution is the same for all grades.

"PRIMO" is our brand for the highest grade Blue Print Paper and Cloth which can be produced.

"STANDARD" is our brand for our second grade Blue Print Paper.

"COMMERCIAL" is our ordinary paper for every day commercial use.

We coat our papers in the three different speeds, suitable for the various demands of the trade.

Our **Regular,** requiring from three to four minutes exposure in sun light.

Our **Rapid,** requiring one minute in sun light.

Our **Extra Rapid,** is a special paper adapted for electric blue printing machines of the various makes. The full exposure is obtained by the fastest running speed of these machines.

We also have an extensive coating plant at our San Francisco branch and our patrons are assured to receive strictly fresh paper at all times.

COMMERCIAL BLUE PRINT PAPERS

(Reduced facsimile of our label)

Our "COMMERCIAL" Blue Print Papers are used most extensively all over the United States and Canada, by large industries, railroad companies, etc., etc., on account of their splendid durability and wearing qualities, and have for a long time been recognized as a Standard when papers are required at reasonable cost.

No. 180. "COMMERCIAL SATIN". Medium Thick.

Width, inches.	27	30	36	42
Per roll of 10 yards	$0 60	$0 70	$0 80	$0 90
" " " 50 "	2 40	2 50	3 15	3 75

No. 181. "COMMERCIAL SATIN." Thick.

Width, inches.	27	30	36	42
Per roll of 10 yards	$0 85	$0 90	$1 10	$1 20
" " " 50 "	3 50	3 75	4 50	5 00

No. 183. "COMMERCIAL PARCHMENT." Thin.

Width, inches.	27	30	36	42
Per roll of 10 yards	$0 60	$0 70	$0 80	$0 90
" " " 50 "	2 40	2 50	3 15	3 75

No. 184. "COMMERCIAL PARCHMENT." Medium.

Width, inches.	27	30	36	42
Per roll of 10 yards	$0 70	$0 80	$0 90	$1 00
" " " 50 "	2 75	3 00	3 50	4 00

Prices on unprepared papers quoted on request.
In ordering please state solution wanted.

Sample rolls of our "COMMERCIAL" blue print papers for test purposes mailed on application

STANDARD BLUE PRINT PAPERS

HIGH QUALITY

(Reduced facsimiles of our labels)

Our **"STANDARD"** Blue Print Papers are made of exceptionally good stock. Where positive prints (blue line on white background) are required, they will be found most excellent and will produce beautiful prints on perfectly white background. We recommend our **"STANDARD"** brands to those who desire to obtain the most satisfactory results at moderate expense.

No. 185. **"STANDARD SATIN." Medium Thick.**

Width, inches	27	30	36	42	54
Per roll of 10 yards	$0 85	$0 90	$1 00	$1 10	$1 75
" " " 50 "	3 75	4 00	4 50	5 00	7 50

No. 186. **"STANDARD SATIN." Thick.**

Width, inches	27	30	36	42	54
Per roll of 10 yards	$0 95	$1 00	$1 15	$1 50	$2 50
" " " 50 "	4 25	4 75	5 50	6 25	9 00

No. 187. **"STANDARD SATIN." Extra Thick.**

Width, inches	30	36	42
Per roll of 10 yards	$1 25	$1 50	$1 75
" " " 50 "	1 50	6 50	7 50

No. 188. **"STANDARD PARCHMENT." Thin.**

Width, inches	27	30	36	42	54
Per roll of 10 yards	$0 80	$0 85	$0 95	$1 10	$1 50
" " " 50 "	3 25	3 50	4 00	4 50	7 00

No. 189. **"STANDARD PARCHMENT." Medium Thick.**

Width, inches	27	30	36	42	54
Per roll of 10 yards	$1 00	$1 10	$1 25	$1 50	$2 25
" " " 50 "	4 50	4 75	5 50	6 50	8 50

Prices on unprepared papers quoted on application.
In ordering please state solution wanted.

Sample rolls of our "STANDARD" blue print papers for test purposes mailed on application, or complete Sample Book for 20 cent

PRIMO BLUE PRINT PAPER AND CLOTH

UNPREPARED **HIGHEST QUALITY**

(Reduced facsimiles of our label)

PRIMO PAPERS are made of the highest grade of **Selected Linen Stock,** and are **guaranteed** to be absolutely **chemically pure.** The utmost care is preserved in the process of manufacturing, the **Linen Stock** being well seasoned, to obtain a **reliable** and **durable** product.

Our papers will be found excellent in **strength** and **uniformity,** and possess unexcelled **keeping** and **printing** properties.

No. 193. **"PRIMO SATIN."** **Medium Thick.** (No. 210 is the same paper prepared).

Width, inches.	30	36	42	54
Per roll of 50 yards, unprepared	$3 75	$4 50	$5 00	$6 75

No. 101. **"PRIMO SATIN."** **Thick.** (No. 211 is the same paper prepared).

Width, inches.	30	36	42
Per roll of 50 yards, unprepared	$4 50	$5 25	$6 00

No. 193. **"PRIMO PARCHMENT."** **Thin.** (No. 213 is the same paper prepared).

Width, inches.	30	36	42	54
Per roll of 50 yards, unprepared	$3 25	$4 00	$4 50	$6 25

No. 195. **"PRIMO PARCHMENT."** **Thick.** (No. 215 is the same paper prepared).

Width, inches.	30	36	42
Per roll of 50 yards, unprepared	$4 50	$5 00	$5 50

No. 196. **"PRIMO BLUE PRINT CLOTH."** (No. 216 is the same cloth prepared).

Width, inches.	30	36	42	54
Per roll of 10 yards, unprepared	$2 50	$3 00	$4 00	$5 50

No. 196½. **"PRIMO BLUE PRINT CLOTH."** **Thin.** (No. 216½ is the same cloth prepared).

Width, inches.	36	42
Per roll of 10 yards	$3 50	$4 50

Special prices per pound will be quoted upon application for Unprepared Blue Print Papers in original rolls

PRIMO" BLUE PROCESS PAPERS

PREPARED

HIGHEST QUALITY

(Reduced facsimiles of our labels.)

Freshly prepared daily with our **regular** or **rapid** or **electric rapid** printing solution.

No. 210. **"PRIMO SATIN." Medium Thick.**

Width, inches.	30	36	42	54
Per roll of 10 yards, prepared	$1 30	$1 50	$1 70	$2 25
" " " 50 " "	5 25	6 25	7 25	9 50

No. 211. **"PRIMO SATIN." Thick.**

Width, inches.	30	36	42	54
Per roll of 10 yards, prepared	$1 40	$1 60	$1 80	.....
" " " 50 " "	6 50	7 50	8 50	.....

No. 213. **"PRIMO PARCHMENT." Thin.**

Width, inches.	30	36	42	54
Per roll of 10 yards, prepared	$1 30	$1 40	$1 60	$2 20
" " " 50 " "	5 00	6 00	7 00	9 00

No. 215. **"PRIMO PARCHMENT." Medium Thick.**

Width, inches.	30	42	42
Per roll of 10 yards, prepared	$1 35	$1 60	$1 75
" " " 50 " "	5 50	6 50	7 50

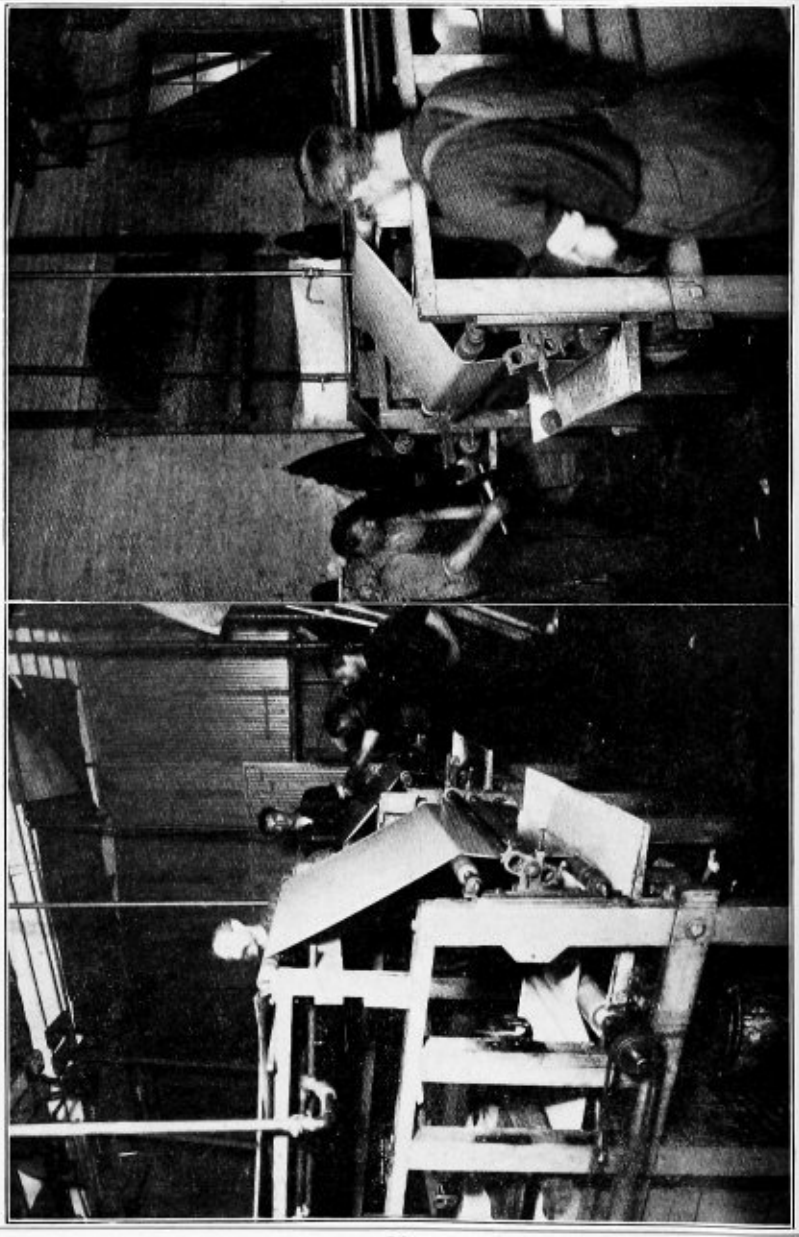
No. 216. **"PRIMO" BLUE PRINT CLOTH. Thick.**

Width, inches.	30	36	42	54
Per roll of 10 yards, prepared	$3 00	$3 60	$4 50	$6 00

No. 216½. **"PRIMO" BLUE PRINT CLOTH. Thin.**

Width, inches.	36	42
Per roll of 10 yards	$4 00	$5 00

In ordering kindly state whether **RAPID** or **REGULAR** solution is wanted



BLUE PRINT PAPER COATING ROOM

"PRIMO" SEPIA SOLAR PAPERS

THE PREMIER BROWN PRINT AND NEGATIVE PAPER, FOR MAKING BROWN OR BLACK NEGATIVE PRINTS AND BLUE OR BLACK PRINTS ON PAPER OR CLOTH.

The advantages of **Primo Sepia Solar Paper** are many, chief of which are the following:

I. It is simple and speedy in action.

II. It keeps well and does not get hard or brittle.

III. It produces a negative copy of the original on a deep brown opaque background.

IV. It saves your original and will not spoil if over-exposed.

V. It is rich in general effect and tone and produces great durability and richness of color.

VI. **Primo Sepia Solar Prints** can be added to, colored or altered, the same as an original drawing.

Maps made with our **Primo Sepia Solar Paper** cannot be distinguished from the finest engraved work.

The Primo Sepia Solar Paper is an improvement on the many crude brown print papers now on the market, is used by the **United States Government** and by several of the leading railroads and manufacturing concerns in this country, **Mexico, Japan** and **Canada.**

DESCRIPTION

The thin paper (our No. 218) is best suited for use as a negative. From this negative, as the original (in place of the tracing), can be produced:—

Blue Line Prints on a white background by printing on **regular** blue print paper or **cloth** with an exposure of about eight minutes in bright sunlight, or on **rapid** Blue Print Paper or **cloth** with an exposure of about four minutes in bright sunlight.

Black Line Prints on a white background by printing on our **No. 220 Medium, No. 221 Thick Primo Sepia Solar Paper** or **No. 222 Primo Sepia Solar Cloth** with an exposure of about eight minutes in bright sunlight.

Prints made by this process are permanent and will never fade.

Miniature sample rolls of our Primo Sepia Solar Papers for test purposes mailed on application, or complete Sample Book for 20 cents

"PRIMO" SEPIA SOLAR PAPERS

FOR NEGATIVE AND POSITIVE PRINTS.

(Reduced facsimiles of our labels)

No. 218. **"PRIMO SEPIA"** Solar Paper. **Thin for Negatives.**

Width, inches.	30	36	42	54
Per roll of 10 yards, prepared	$1 80	$ 2 20	$ 2 70	$ 4 00
" " " 50 " "	9 00	10 50	12 50	20 00

No. 220. **"PRIMO SEPIA"** Solar Paper. **Medium thick for Positives.**

Width, inches.	30	36	42	54
Per roll of 10 yards, prepared	$1 80	$ 2 20	$ 2 70	$ 4 00
" " " 50 " "	9 00	10 50	12 50	20 00

No. 221. **"PRIMO SEPIA"** Solar Paper. **Thick for Positives.**

Width, inches.	30	36	42	54
Per roll of 10 yards, prepared	$3 00	$ 3 50	$ 4 00	$ 5 50
" " " 50 " "	14 50	17 00	19 00	25 00

No. 222. **"PRIMO SEPIA"** Solar Cloth. **For Positives.**

Width, inches.	30	36	42	54
Per roll of 10 yards, prepared	$4 50	$5 00	$6 00	$10 00

No. 222½. **"PRIMO SEPIA"** Solar Cloth. **Thin.**

Width, inches.	36	42
Per roll of 10 yards, prepared	$6 00	$7 00

Fixing Salts and full directions sent with each roll.

"PRIMO" SEPIA FIXING SALTS

For permanently fixing and intensifying prints.

No. 224. Per 4-ounce box $0 15
No. 225. Per 1 Pound 35

Use the **No. 218** to make your **negative** copies on.
For full description of paper, see preceding page.

Pasteboard and Metal Tubes for preserving sensitized papers listed on page 40

"PRIMO" POSITIVE BLACK AND POSITIVE BLUE PROCESS PAPERS

PREPARED

HIGHEST QUALITY

(Reproduced facsimiles of our labels)

"PRIMO POSITIVE BLACK" Print Paper is used the same as blue printing paper. Requires only one bath and will produce black lines on a white background and suitable to make additions representing original drawings, and if desired, water colors can be applied with ease.

The paper will retain its good printing qualities for a reasonable length of time if preserved in a dry, cool place.

Full instructions furnished with each roll.

No. 226. **"PRIMO POSITIVE BLACK"** Print Paper.

Width, inches.	30	36	42
Per roll of 10 yards	$2 00	$2 50	$3 00

"PRIMO POSITIVE BLUE" Print Papers have very recently been placed on the market, although the process has been known a long time back, being first invented by Prof. Herschell, of Germany. But, on account of its many disadvantages and troublesome manipulations in making the prints, has never been very popular.

Since our **Primo Sepia Solar** Papers have been introduced for making blue line prints, the **Positive Process** has almost been abandoned.

In the interest of our patrons we must urgently recommend the continuous use of our **Primo Sepia Solar** Paper, when but a small number of prints are wanted. But, for those that have acquainted themselves with the working of the **Positive Process**, we can supply them with a first quality paper, absolutely guaranteed by us to give perfect results.

Positive papers require a Developing and Acid Bath. Full instructions with each roll.

No. 227. **"PRIMO POSITIVE BLUE"** Print Paper.

Width, inches.	30	25	42
Per roll of 10 yards	$1 25	$1 40	$1 60
" " 50 "	5 00	6 00	7 00

Sample rolls of our "POSITIVE BLACK AND BLUE" print papers for test purposes mailed on application

PHOTOGRAPHIC CLIPS

No. 229.

No. 229. Spring Clips for hanging prints to dry.....Per dozen, $0 25

ERASING FLUIDS

No. 230. **"WHITE" Primo Erasing Fluid.** For making alterations and additions on blue prints.
Per bottle of ¾-oz.....$0 20

No. 231. **"RED" Primo Erasing Fluid.** For marking or coloring blue prints.
Per bottle of ¾-oz.....$0 20

No. 232. **"YELLOW" Primo Erasing Fluid.** For marking or coloring blue prints.
Per bottle of ¾-oz.....$0 20

No. 233. **"PRIMO SEPIA" Erasing Fluid.** For making alterations on **Primo Sepia Solar Prints.**
Per bottle of ¾-oz.....$0 20

For "Primo Direct Copier" for Blue Prints see page 24

AIR-TIGHT METAL TUBES

For Preserving Sensitized Paper

No. 236.

Made of galvanized tin with close fitting covers. Keeps **Blue Print** and **Brown Print Papers** dry and dark and also used for the safekeeping of **valuable tracings.**

No. 236.	For 50-yard rolls,	31	inches long,	4	inches diameter	.....	Each,	$1	10
No. 237.	"	"	"	37	"	"	4	"	"	.....	"	1	25
No. 238.	"	"	"	43	"	"	4	"	"	.....	"	1	35
No. 236A.	"	10-yard	"	31	"	"	2	"	"	.....	"		95
No. 237A.	"	"	"	37	"	"	2	"	"	.....	"	1	00
No. 238A.	"	"	"	43	"	"	2	"	"	.....	"	1	10

PASTEBOARD TUBES WITH METAL SCREW CAPS

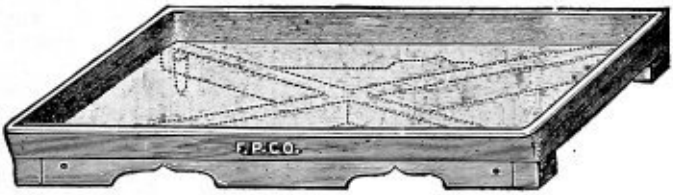
For Mailing and Preserving 10-Yard Rolls of Sensitized Paper

Made of strong Jute stock with tight fitting screw caps

No. 236½.	31	inches long,	2½	inches diameter	.....	Each,	$0	30
No. 237½.	37	"	"	2½	"	"	.....	"		35
No. 238½.	43	"	"	2½	"	"	.....	"		45

Also see page 27.

GALVANIZED IRON BATH TRAYS



No. 239A.

Zinc or galvanized iron trays with drain pipe, strong-wired rim and hardwood braces.

No. 239A.	18 × 22	inches	.....	Each, $ 4 00
No. 239B.	20 × 24	"	.....	" 5 00
No. 239C.	24 × 30	"	.....	" 6 00
No. 239D.	30 × 42	"	.....	" 7 00
No. 239E.	36 × 60	"	.....	" 12 00
No. 239F.	44 × 72	"	.....	" 15 00

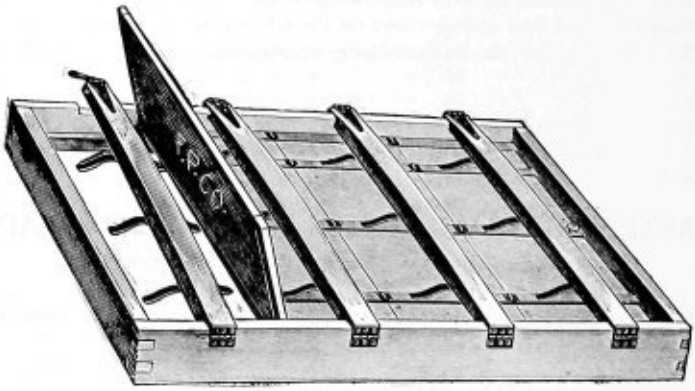
Other Sizes Made to Order

BLUE PRINT FRAMES

MADE OF BEST SEASONED HARDWOOD. WARRANTED NOT TO SHRINK
NEATLY FINISHED WITH BRASS MOUNTINGS

FURNISHED WITH OR WITHOUT FELT OR GLASS

FIRST QUALITY



No. 240A.

	Printing Surfaces	Inside Dimensions		Frames Only	With Felt Cushions	Complete With Pol. Plate Glass
No. 240A.	16×22 inches,	19½×23½	Each,	$ 5 00	$ 6 00	$10 00
No. 240B.	20×24 "	21½×25½	"	6 00	6 75	13 00
No. 240C.	24×30 "	25½×31½	"	8 00	9 00	17 00
No. 240D.	24×36 "	25½×37½	"	9 50	11 00	18 00
No. 240E.	30×42 "	32 ×44	"	12 50	14 00	22 00
No. 240F.	36×60 "	38 ×62	"	20 00	22 00	42 00
No. 240G.	42×60 "	44 ×62	"	22 00	25 00	46 00
No. 240H.	54×84 "	57 ×87	"	28 00	33 00	60 00

SMALLER FRAMES FOR OFFICE USE

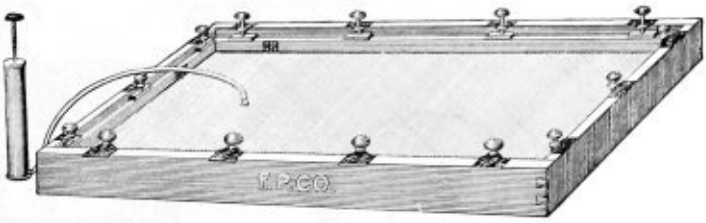
No. 242. 11×16 inches, with double thick glass and pad.....Each, $3 50
No. 242A. 16×21 " " " " " " " " ..... " 4 50

All sizes for photographers' use carried in stock.

FELT FOR PRINTING FRAMES

No. 243. 72 inches wide.....Per yard, $2 50

THE "ECLIPSE" VACUUM BLUE PRINT FRAME



No. 244A.

The Vacuum Frame shown above are entirely new in construction. The cumbersome crossbars and springs used in the old style frames have been done away with and the rubber pad is clamped down by means of bars, placed along the edges on the inside of the frame. The bars are pressed against the Improved Vacuum Cushion included with each frame, by tightening a number of hand screws, this making the frame perfectly air-tight.

For obtaining the **closest contact,** these frames of our own special manufacture are unsurpassed.

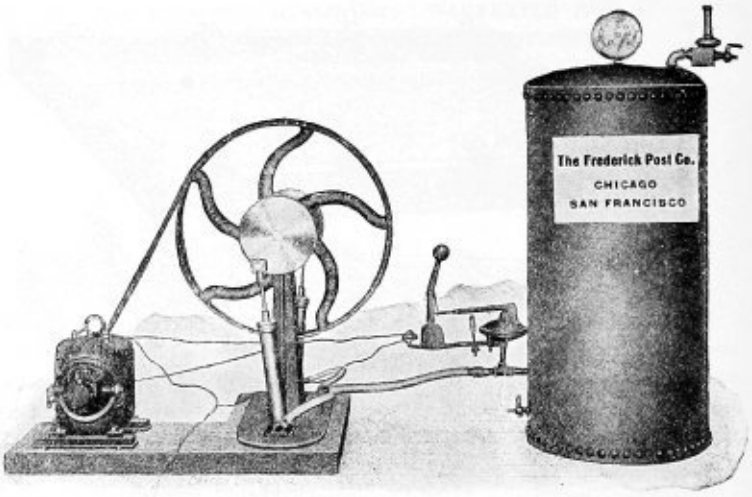
By means of a hand or vacuum pump, the air is entirely exhausted between the cushion and the glass, forming the **best contact** obtainable between the tracing and sensitized paper.

By the use of the **"Eclipse" Vacuum Sun Frames,** the faintest lines of a drawing can be **reproduced,** or drawings wrinkled or worn by much handling can be **flattened** out and good prints taken therefrom. **Primo Sepia Solar Prints** (in which process contact is a first essential) can be made exceptionally **sharp** and **distinct.**

		Printing surface	Inside dimensions	Frames without glass, but with felt and vacuum pad	Complete with vacuum pad, felt and polished plate glass
No. 244A.	Vacuum Frame	30×42	32×44	Each,	$ 45 00	$ 60 00
244B.	" "	36×60	38×62	"	55 00	77 00
244C.	" "	42×72	45×75	"	75 00	100 00
244D.	" "	54×84	57×87	"	100 00	135 00

Other sizes made to order

AUTOMATIC ELECTRIC AIR VACUUM OUTFIT



No. 245.

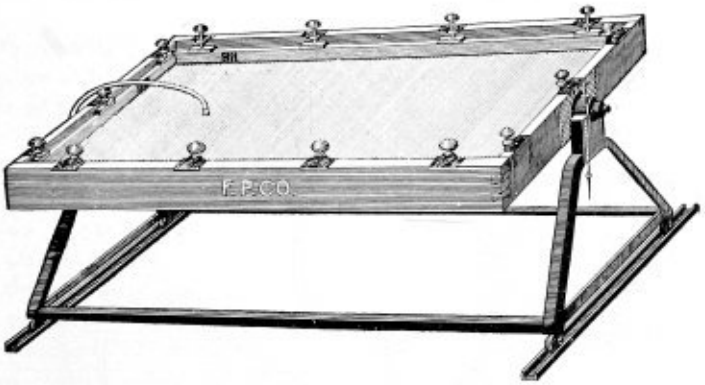
This outfit is very rigid and durably built with adjustable bearings, self-oiling motor and will supply sufficient air-pressure to insure good contact. It works entirely automatic (see automatic electric switch), and all the attention it requires is that it be oiled two or three times a week. This outfit is shipped almost entirely connected and all that is necessary to do to install same is to screw the attachment plug into the lamp socket.

No. 245.	**Automatic Electric Air Vacuum Outfit,** ¼-H. P. Motor (110 or 220 volts, direct current)	Complete,	$120 00
No. 246.	Vacuum Hand Pump	Each,	$10 00
No. 246A.	Rubber Hose	Per foot,	10
No. 247.	Vacuum Rubber Cushion	Per sq. ft.,	2 50
No. 247A.	Vacuum Valve	Each,	2 50

OIL CLOTH

No. 247½.	Oil cloth for covering plans and tracings. **Black.** 48 inches wide.		
	Per roll of 10 yards		$2 75
	Per yard		30

BLUE PRINTING FRAMES ON CARRIAGES



No. 249A

This car can be used with or without tracks and carries the largest frames with ease. It is very compact and strong and will pass through medium sized windows.

The frame revolves and can be clamped at any angle. It is held firmly in position while loading by means of a brace, which can be swung back and dropped into the guards in the center, thus allowing the frame to revolve.

CARRIAGE WITH FRAMES NOS. 240 TO 240E

	Printing surface	Inside dimensions of frame	Without glass or felt pad	With felt pad	Complete with felt pad and polished plate glass
No. 248A.	24×30	25½×31½	Each, $30 00	$31 00	$37 00
248B.	24×36	25 ×38	" 30 50	31 60	38 75
248C.	30×42	32 ×44	" 35 00	36 75	45 00
248D.	36×60	38 ×62	" 45 00	48 00	70 00
284E.	42×72	45 ×75	" 58 00	62 00	90 00

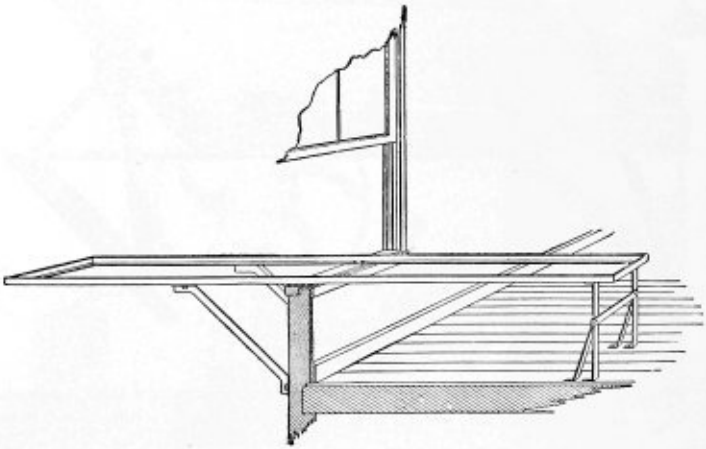
VACUUM PRINTING FRAMES ON CARRIAGES

	Printing surface	Inside dimensions of frame	Frames without glass, but with felt and vacuum pad	Complete with vacuum pad, felt and polished plate glass
No. 249A.	30×42	32×44	Each, $ 75 00	$ 90 00
249B.	36×60	38×62	" 97 00	120 00
249C.	42×72	44×75	" 123 00	152 00
249D.	54×84	57×87	" 150 00	190 00

Other sizes made to order

When ordering please state whether frame is wanted with or without glass or pad.

TRACK FOR BLUE PRINT CARS



No. 250.

On this track arrangement blue print cars may be run out of window for exposure. The tracks may be modified to suit certain conditions and can be furnished by us complete with blue print frame and car.

The arrangement can be used in connection with any of the frames and cars shown on pages 41, 42, 44, regardless of size and with either plain or vacuum frames.

No. 250. **Set of Tracks** and **Supports** for blue print cars.

Prices on application.

In ordering, please state **height of window sill from floor, thickness of wall, width of window sill and clear aperture of window.**

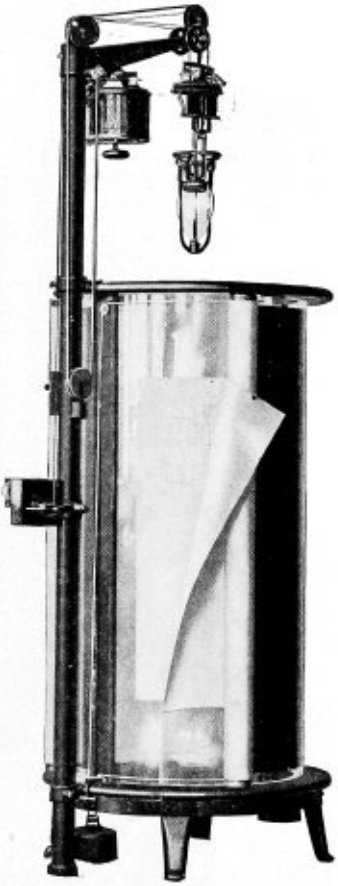
Figures submitted on any track arrangement to suit customers' requirements.

"BUCKEYE" ELECTRIC BLUE PRINT MACHINES

In simplicity of construction this machine surpasses all others. It requires the attention of but one attendant in connection with his other work and can be manipulated by a boy with perfect results.

The machine is entirely self contained. It is fastened in no way to the wall, ceiling or floor, and is therefore easily moved from one place to another.

The expense of operation is based upon the cost of the electric current consumed by the lamp, and the cost of carbons used in the lamp. Each set of carbons will burn about one hundred hours and the cost per set is about five cents.



No. 251 **"BUCKEYE"** Electric Blue Print Machines.

Style "A." Makes two prints 42×44 inches.....Each, $225 00
Weight packed, 800 lbs.

Style "B". Makes two prints 42×60 inches.....Each, 250 00
Weight packed, 1,000 lbs.

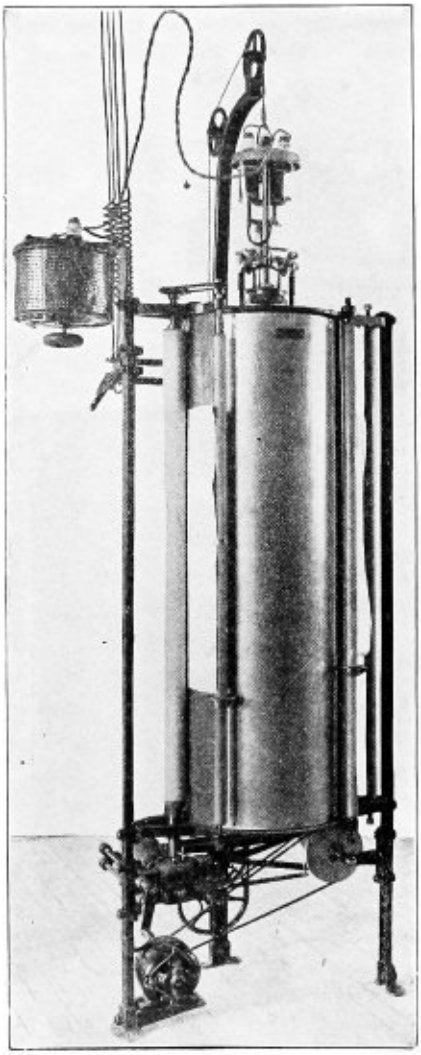
Style "C." Makes two prints 42×72 inches.....Each, 300 00
Weight packed, 1,200 lbs.

Lamps, complete.....Each, 35 00
Globes, small or large..... " 50

F. O. B. Factory.

NOTE—When ordering always state the number of volts and whether your current is direct or alternating.

THE SHAW CONTINUOUS BLUE PRINT MACHINE



The operation of this machine is remarkable for its simplicity, convenience and effectiveness. The "Shaw" operates by a single arc lamp using 15 amperes at 110, or 7½ amperes at 220 volts, traveling up and down continuously in the center of a half cylinder of glass, while the paper and tracing are carried around on an endless canvass band.

All that is necessary is to insert the ends of the paper and tracing and the machine does the rest.

The feeding of the paper and tracing is absolutely automatic.

The absolute even contact results in sharp, clear, effective prints.

A boy can operate it.

It makes continuous prints of any length.

It only occupies a very small space, 2 feet 6 inches square and head-room of 8 feet.

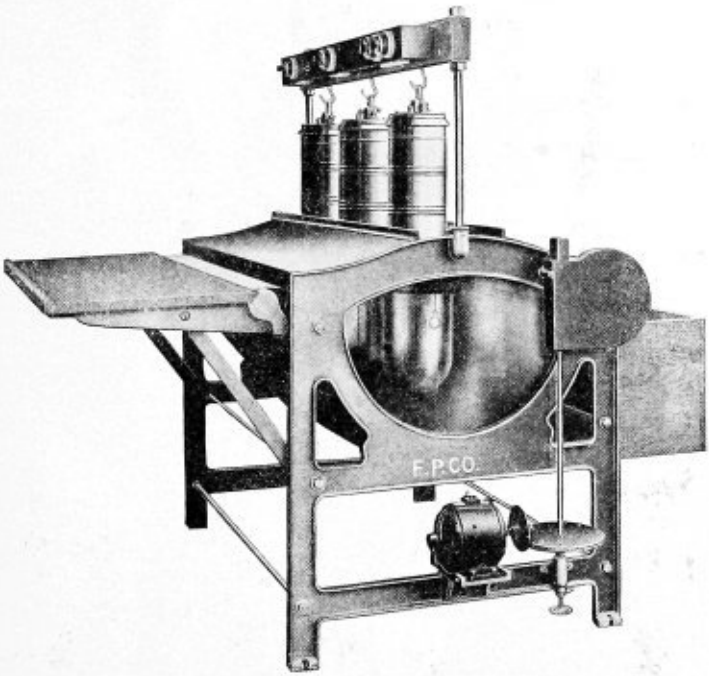
No. 252A. **SHAW CONTINUOUS BLUE PRINT MACHINE.** 42 inches Each.....$300.00

No. 252B. **SHAW CONTINUOUS BLUE PRINT MACHINE.** 54 inches Each.....$350 00

Price—F. O. B. Factory

THE "SIMPLEX" CONTINUOUS BLUE PRINT MACHINE

In our Simplex continuous blue print machine we offer you the only modern priced machine which reaches the greatest degree of perfection yet attained by any of the most expensive machines, in the important features of closeness of contact, convenience of operation, fast printing, low current consumption, etc.

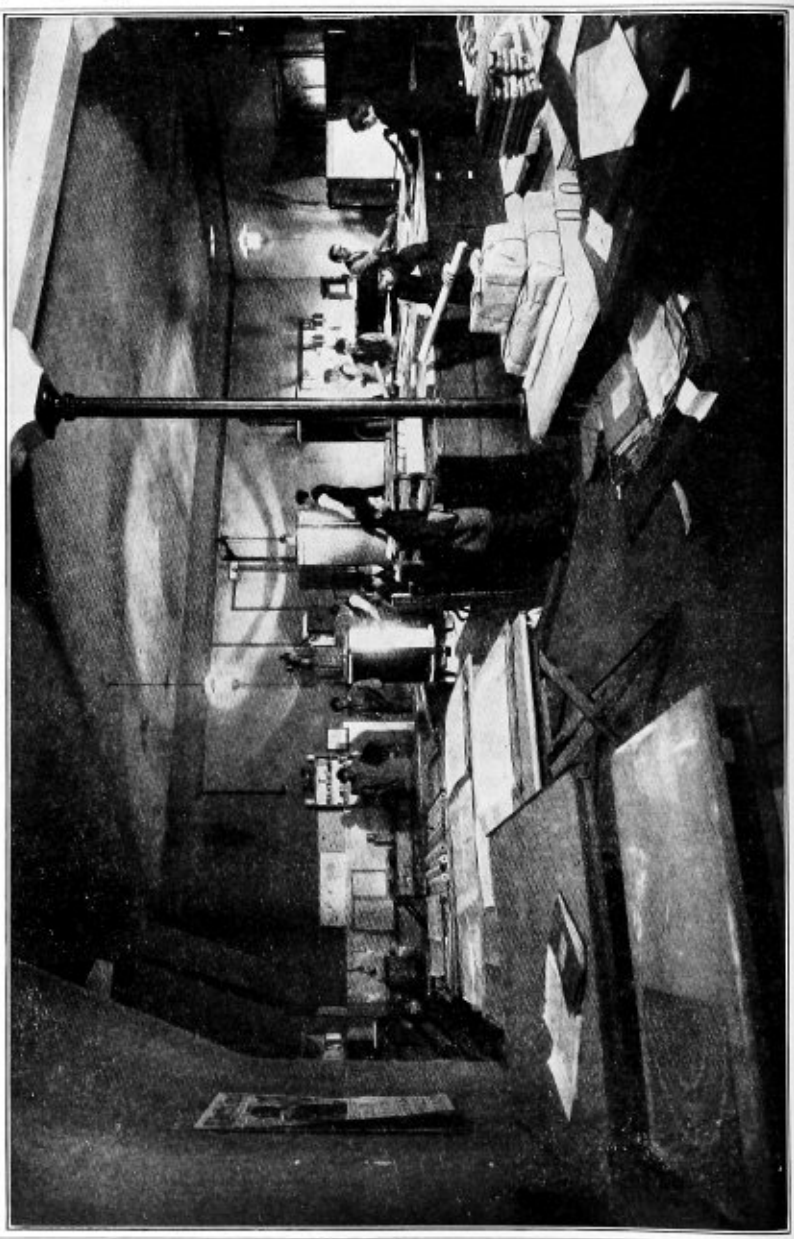


No. 253.

No. 253. "Simplex" Continuous Blue Print Machine, with 3 Arc Lamps and 1-6 horse-power motor, 110-volt direct current, 42-inch. Complete, equipped ready to operate ..... Each, $300 00

No. 253A. "Simplex" Continuous Blue Print Machine. Same as No. 253, but with 4 Arc Lamps and ¾ horse-power motor, 54-inch ..... Each. 400 00

The above machines equipped with alternating current, add $25.00 to above price.



BLUE PRINTING DEPARTMENT, CITY OFFICE

REPRODUCTION DEPARTMENT

—Continued

We have always taken special pride in the thorough efficiency of this department of our business and have succeeded in making it the most modern, up-to-date and best equipped Printing Department in the United States. Our equipment consists of the best and latest makes of Electric Blue Printing Machines, Vacuum Sun Frames, Drying and Ironing Machines, which, together with experienced operators, enable us to turn out the best possible work and make prompt deliveries.

Map Printing is a specialty with us, we numbering on our books some of the leading County Surveyors, City and Railroad Engineers of this country, and can truthfully state that the **Black Line on White Prints** we are making with our **Primo Sepia Solar Papers** cannot be distinguished from the finest engraved work; the cost being a great deal less.

PRICE LIST

Blue Prints on Paper	per square foot,	$0 02
" " " Cloth	" " "	08
Negative (Brown) Prints	" " "	07
Blue Line on White Paper Prints	" " "	03
" " " " Cloth "	" " "	10
Black " " Paper "	" " "	08
" " " " Cloth "	" " "	15
Hektograph Prints on Paper (white)	" " "	02
" " " " (manila)	" " "	01½
" " " Cloth	" " "	06

All prints under 3 square feet charged by the sheet, governed entirely by size of job. Prints mounted on heavy muslin, matboard, hung on rollers, etc., at lowest prices.

IMPORTANT

The utmost precaution taken to protect work entrusted to our care, and we are responsible for a drawing from its receipt until it leaves our house.

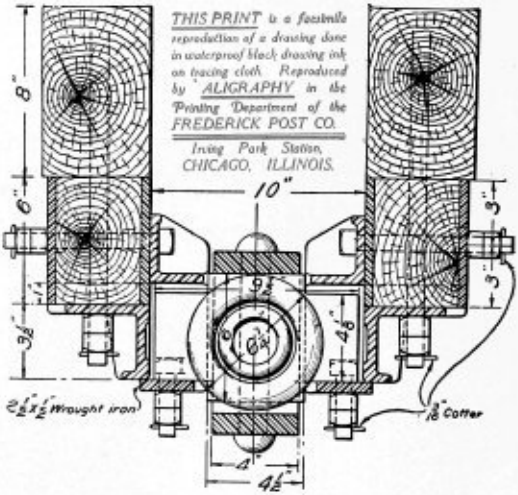
SPECIAL PRICES QUOTED ON LARGE JOBS

We respectfully solicit your correspondence and business.

ALIGRAPHY

A NEW REPRODUCING PROCESS

We take great pleasure in announcing that we have succeeded in placing on the market a new and absolutely perfect process for reproducing technical drawings. The **"Aligraphy"** process was invented in our own laboratory, and although elaborate and expensive equipments are necessary, the working of the process is quite simple and the results obtained are of such excellent quality as to meet the most stringent requirements.



CROSS SECTION VIEW

These prints are **absolutely permanent** and the reproduction is an exact duplicate of the original, correct to scale and can be used in the same way as the original drawing. The making of the prints requires less time than the photographic process. A very important point in this new process is that the paper on which the prints are made **does not get wet**; the process being a **perfectly dry** one and therefore the paper will not lose its strength and toughness as it invariably does in the wet process.

Single copies on Standard paper, No. 180 or 183, unprepared				Per square foot,	$0 10
In lots of	10	copies or more		" " "	09
" " "	20	" " "		" " "	08
" " "	50	" " "		" " "	06
" " "	100	" " "		" " "	05
Single copies on "Primo" cloth, No. 196 or 196½				" " "	20
In lots of	10	copies or more		" " "	18
" " "	20	" " "		" " "	16
" " "	50	" " "		" " "	12
" " "	100	" " "		" " "	10

We respectfully solicit trial orders for this process and shall be glad to mail samples upon request.

Reproductions on Tracing Cloth prices on request

THE ACME DUPLICATOR

IN JAPANNED TIN PADS

"Patent Applied For"

For copying plans, specifications, menus and all typewritten matter

These pads also filled with **Multiplex Copier,** a gelatinous composition for multi-copy work, at same prices.

Size	7 × 11 inches	Each,	$ 2 00
"	10 × 12 "	"	3 50
"	13 × 17 "	"	6 50
"	13 × 24 "	"	12 00

Any large size made to order on **short notice.** Pads sent us to be refilled will be charged at the rate of $1.00 less than above prices. Full directions with each pad. Kindly state composition desired. If left to our judgment, pads will be filled with **Acme Duplicator,** which we strongly recommend.

MATERIAL FOR COPYING BY THE ACME DUPLICATOR PROCESS

No. 255. **ROPE FIBRE** Paper, for copying.

	Width, 36 in.	42 in.	48 in.
Per roll of 100 yards	$5 00	$6 00	$7 00

No. 256. **"WHITE"** Paper, for copying.

	Width, 30 in.	36 in.	42 in.
Per roll of 50 yards	$3 00	$3 75	$4 50

No. 257. **"WHITE"** Cloth, for copying.

	Width, 30 in.	36 in.	42 in.
Per roll of 10 yards	$2 50	$3 00	$4 00

Drawings to be copied by the **Acme Duplicator Process** may be made on tracing paper, saving the expense in material and time of using Tracing Cloth.

Samples of the work mailed on application

THE ACME DUPLICATOR

IN BULK

Patent Applied For

The cheapest, simplest and most effective hektograph composition on the market.

For reproducing bills of material, architects' plans, specifications, menus, brokers' reports, circular letters, etc.

Not affected by weather conditions, never gets hard or cakes, and retains its full copying abilities until entirely used.

No. 258. **Acme Duplicator**, in 10-pound Fancy Manila Cartons, lined with wax paper.
Per pound $0 25

DIRECTIONS FOR USING ACME DUPLICATOR

Place the brick of **Acme Duplicator** in pad or tray and spread evenly over entire surface. See that surface is perfectly smooth; if same is sweaty, cover for a few minutes with newspapers or blotting paper to absorb the moisture.

Place the original, made with the **Acme Transfer Ink**, on the surface, face downward, and rub it with a cushion until all the lines and figures come in contact with the surface of the pad.

Remove the original and proceed to take as many copies as required.

Clean the surface with a wet sponge until impression is removed, then the surface is ready for another original.

Full Directions printed on each box.

THE ACME TRANSFER INK

The strongest hektograph ink manufactured, produces fifty distinct copies from one original. Copies made with Acme Transfer Ink will not fade.

Manufactured in 1, 8, 16, and 32-ounce bottles.

		32 oz.	16 oz.	8 oz.	1 oz.
No. 258A.	Violet	$ 5 00	$2 50	$1 25	$0 25
No. 258B.	Blue	5 00	2 50	1 25	25
No. 258C.	Red	5 00	2 50	1 25	25
No. 258D.	Brown	5 00	2 50	1 25	25
No. 258E.	Yellow	5 00	2 50	1 25	25
No. 258F.	Green	5 00	2 50	1 25	25
No. 258G.	Black	10 00	5 00	2 50	50

Acme Transfer Ink should be protected from extreme heat or cold and kept tightly corked when not in use

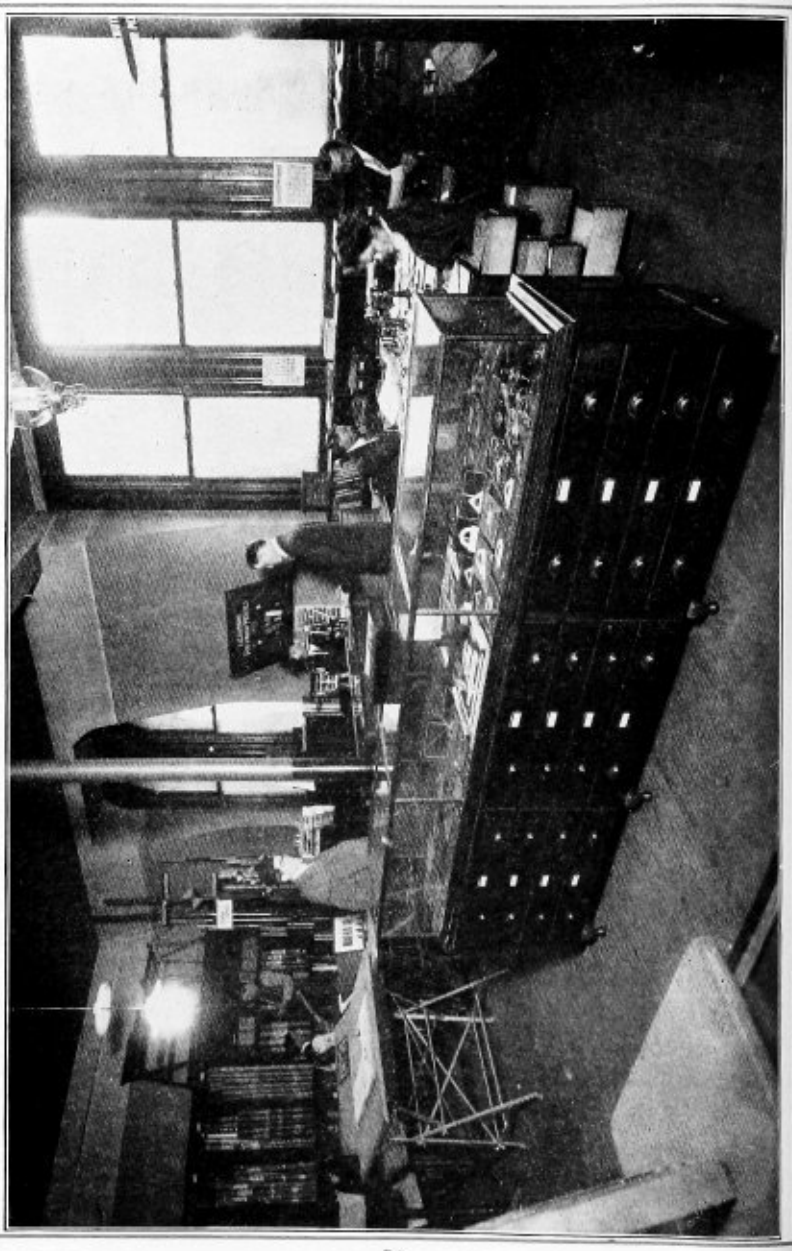
LEGAL BLANKS FOR BUILDING TRADES

Standard Printed Specifications, for buildings $500.00 and over. Each set consists of thirteen sheets in strong Manila cover as follows:

1. Preamble, 2 pages suitable for any building.
2. Masons, 2 " 14 headings and descriptions.
3. Plasterers, 1 " 12 " " "
4. Carpenters, 6 " 38 " " "
5. Painters, 2 " 18 " " "
6. Plumbers, 2 " 17 " " "
7. Sewers, 2 " 17 " " "
8. Iron, 1 " 6 " " "
9. Galvanized Iron, 2 " 15 " " "
10. Contractors' Statement, 1 page.
11. Contract between Owner and Architect, 2 pages.
12. Agreement between Architect (or Owner) and Contractor, with Bond, 2 pages.

No. 259. Single sets $0 25
Per dozen sets 2 50

		Per 100	Per quire
Form 12.	Building Contract, copyrighted	$1 75	$0 50
Form 12A.	Building Contract with Bond	1 75	50
Form 13.	Contract between Owner and Architect	1 75	50
Form 15.	Contractors' Statement	1 75	50
Form 17.	Waiver of Lien	1 75	50
Form 18.	Mechanic's Lien Notice	1 75	50
Form 19.	The Uniform Contract, copyrighted	1 75	50
Form 20.	Architect's Certificate Books, 100 blanks, each	50	.....



PREFERRED PROFILE PAPERS AND CLOTHS

(Reduced facsimiles of our labels.)

Our **Preferred Profile and Cross Section Papers** are engraved from new and absolutely accurate rollers; the lines are distinct, the background clear and unclouded. They are perfect in drawing and erasing qualities, the highest grade being used in their manufacture.

The **Preferred Transparent Profile and Cross Section Papers** are printed on the finest imported tracing paper, will erase perfectly and are especially adapted for blue printing.

Plate A, 4×20 to one inch.

			Per Roll	Yard
No. 260.	Plate A, **On Drawing Paper,** Printed in Orange or Green.	20 in. wide, 50-yard rolls.	$10 00	$0 24
No. 261.	Plate A, **Mounted on Muslin,** Printed in Orange or Green	20 in. wide, 20-yard rolls.	10 00	60
No. 266.	Plate A, **On "Primo" Cloth,** Printed in Orange or Green.	20 in. wide, 20-yard rolls.	10 00	60
No. 268.	Plate A, **On Tracing Cloth,** Printed in Orange or Green.	20 in. wide, 20-yard rolls.	14 00	80
No. 269.	Plate A, **On Tracing Paper,** Printed in Orange only.	20 in. wide, 50-yard rolls.	10 00	24

When ordering please state color.

Samples of Profile Papers and Cloth mailed on application, or complete Sample Book for 20 cents

PREFERRED PROFILE PAPERS AND CLOTHS —Continued

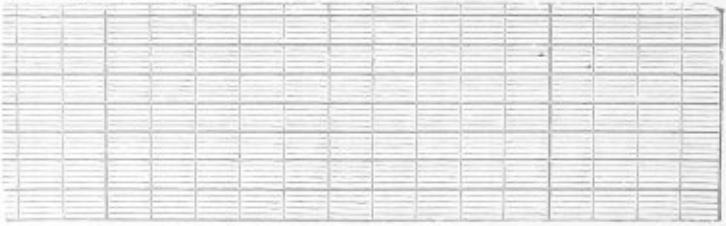


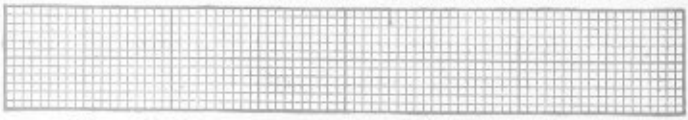
Plate B, 4×30 to one inch.

			Per roll	Yard
No. 270.	Plate B, **On Drawing Paper,** Printed in Orange or Green.	20 in. wide, 50-yard rolls.....	$10 00	$0 24
No. 271.	Plate B, **Mounted on Muslin,** Printed in Orange or Green.	20 in. wide, 20-yard rolls.....	10 00	60
No. 276.	Plate B, **On "Primo" Cloth,** Printed in Orange or Green.	20 in. wide, 20-yard rolls.....	10 00	60
No. 278.	Plate B, **On Tracing Cloth,** Printed in Orange or Green.	20 in. wide, 20-yard rolls.....	14 00	80
No. 279.	Plate B, **On Tracing Paper,** Printed in Orange only.	20 in. wide, 50-yard rolls.....	10 00	24

PREFERRED CROSS SECTION PAPERS IN SHEETS

Nos. 284-285. 10×10 to ½ inch, every fifth line heavy.

			Per quire
No. 284.	In sheets 5× 7 inches,	on drawing paper, green only.....	$0 25
No. 284T.	" " "	on tracing " orange "	25
No. 285.	In sheets 7×10 "	on drawing " green "	30
No. 285T.	" " "	on tracing " orange "	30



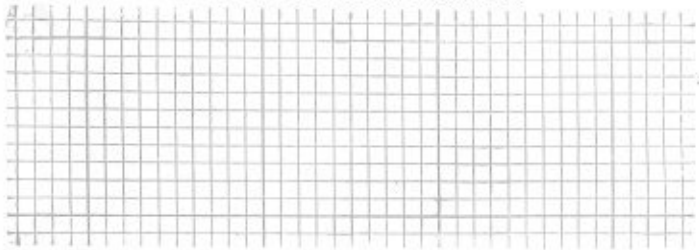
Nos. 286-287. 20×20 to 1 inch, every tenth line heavy.

			Per quire
No. 286.	In sheets 5× 7 inches,	on drawing paper, green only.....	$0 25
No. 286T.	" " "	on tracing " orange "	25
No. 287.	In sheets 7×10 "	on drawing " green "	30
No. 287T.	" " "	on tracing " orange "	30

The printed Cross Section Papers are more reliable and accurate than the ruled Cross Section Papers and of a better stock of paper.

Samples of Cross Section Papers mailed on application, or complete Sample Book for 20 cents

PREFERRED CROSS SECTION PAPERS AND CLOTHS IN SHEETS AND ROLLS



10 × 10 to one inch.

		Per roll	Per yard
No. 290.	Cross Section, On Drawing Paper, 20 in. wide, 50-yard rolls. Printed in Orange or Green.	$10 00	$0 24
No. 291.	Same Pattern, Mounted on Muslin, 20 in. wide, 20-yard rolls. Printed in Orange or Green.	10 00	60
No. 292.	Same Pattern, On "Primo" Cloth, 20 in. wide, 20-yard rolls. Printed in Orange or Green.	10 00	60
No. 293.	Same Pattern, On Tracing Cloth, 20 in. wide, 20-yard rolls. Printed in Orange or Green.	14 00	80
No. 294.	Same Pattern, On Tracing Paper, 20 in. wide, 50-yard rolls. Printed in Orange only.	10 00	24

		Per quire	Per sheet
No. 295.	In sheets 16×20 in. On Ledger Paper. Printed in Orange or Green.	$3 50	$0 20
No. 295½.	In sheets 16×20 in. On Tracing Paper. Printed in Orange only.	3 50	20

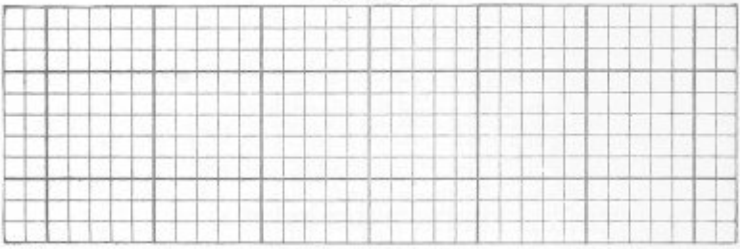
Millimeter

		Per roll	Per yard
No. 296.	Millimeter On Drawing Paper. 50 cm. wide, 50-yard rolls. Printed in Orange or Green.	$10 00	$0 24
No. 297.	Millimeter Mounted on Muslin. 50 cm. wide, 20-yard rolls. Printed in Orange or Green.	10 00	60
No. 298.	Millimeter On Tracing Paper. 50 cm. wide, 50-yard rolls. Printed in Orange only.	10 00	24
No. 299.	Millimeter On Tracing Cloth. 50 cm. wide, 20-yard rolls. Printed in Orange or Green.	14 00	80

When ordering, please state color

Samples of Cross Section Papers mailed on application, or complete Sample Book for 20 cents

PREFERRED CROSS SECTION PAPERS IN SHEETS
—Continued

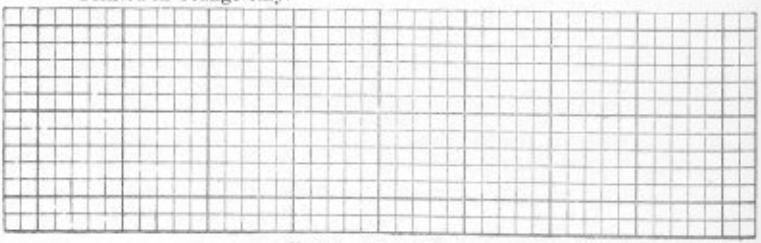


No. 300. 8 × 8 to one inch.

		Per quire	Per sheet
No. 300.	In sheets 16×20 inches **On Ledger Paper**.....	$3 50	$0 20
	Printed in Orange or Green.		
No. 301.	In sheets 16×20 inches **On Transparent Paper**.....	3 50	20
	Printed in Orange only.		

No. 302. 16 × 16 to one inch.

		Per quire	Per sheet
No. 302.	In sheets 16×20 inches **On Ledger Paper**.....	$3 50	$0 20
	Printed in Orange or Green.		
No. 303.	In sheets 16×20 inches **On Transparent Paper**.....	3 50	20
	Printed in Orange only.		



No. 304. 5 × 5 to ½ inch.

		Per quire	Per sheet
No. 305.	In Sheets 16 ×20 inches **On Ledger Paper**.....	$3 50	$0 20
	Printed in Orange or Green.		
No. 306.	In sheets 16×20 inches **On Transparent Paper**.....	3 50	20
	Printed in Orange only.		

When ordering please state color.

Samples of Cross Section Papers mailed on application, or complete Sample Book for 20 cents

PREFERRED CROSS SECTION PAPERS IN SHEETS
—Continued

No. 342. 10×10 to 1 inch.

No. 342. In sheets 16×21 inches, ruled in blue.....Per quire, $1 00

No. 344. 8×8 to 1 inch.

No. 344. In sheets 16×21 inches, ruled in blue.....Per quire, $1 00

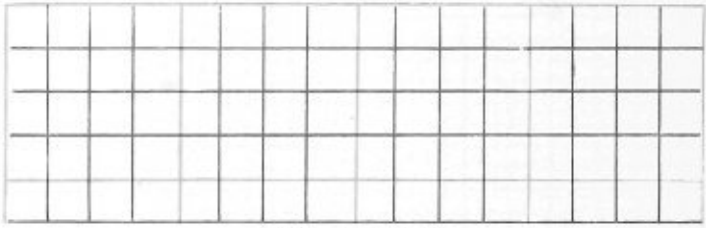
No. 345. 5×5 to 1 inch.

No. 345. In sheets, 16×21 inches, ruled in blue.....Per quire, $1 00

Samples of Cross Section Papers mailed on application, or complete Sample Book for 20 cents

PREFERRED CROSS SECTION PAPERS IN SHEETS

—Continued

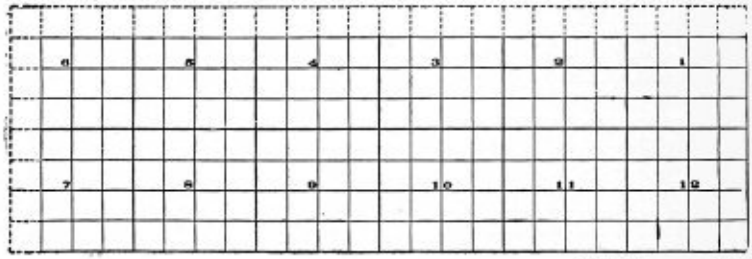


No. 346. 4×4 to 1 inch.

Topographical Paper.

No. 346. In sheets 16×21 inches, ruled in red and blue.....Per quire, $1 00

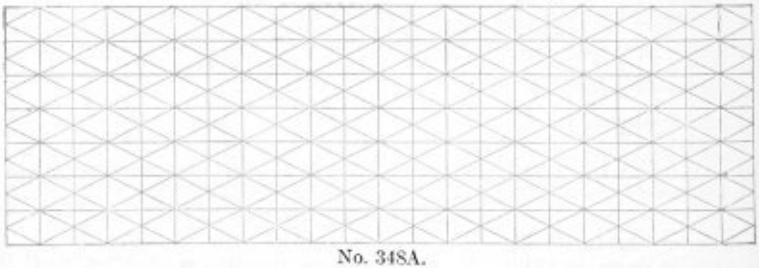
TOWNSHIP PAPER



	Per quire	Per sheet
No. 347. Engraving 15×18 in., black only.....	$3 00	$0 15

ISOMETRIC SKETCHING PAPER

For making Drawings and Sketches in Isometric Perspective. Ruled

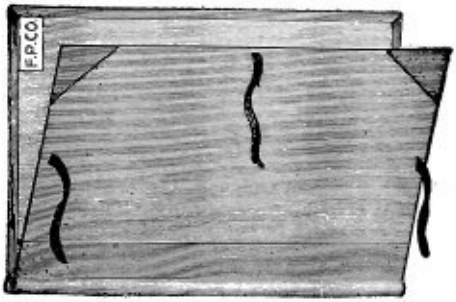


No. 348A.

No. 348A.	Ruled in green, in sheets 12×18 in.....Per quire,	$0 80
No. 348B.	" " " " pads of 40 sheets, 6× 9 in.....Each,	30
No. 348C.	" " " " " " 40 " 9×12 " ..... "	60

Sample of Cross Section Papers mailed on application, or complete Sample Book for 20 cents

PORTFOLIOS



No. 349A.

No. 349A. Paper Sides, Cloth Back and Corners, with three Flaps.

Sizes, inches,	12×16	14×18	17×22	20×26	23×31
Each	$0 50	0 60	0 70	1 00	1 50

No. 349B. Cloth Sides, Leather Back and Corners, with three Flaps.

Sizes, inches,	12×16	14×18	17×22	20×26	23×31
Each	$1 00	1 25	1 50	2 00	2 50

No. 349C. School Portfolio, without Flaps, Paper Sides, Cloth Corners and Back.
20×26 inches ..... Each, $0 75

CROSS SECTION BLOCKS

OF PRINTED CROSS SECTION PAPER

No. 350.	5× 7 inches,	10×10 to 1 inch,	24 sheets	Each,	$0 70
No. 351.	5× 7 "	6× 8 " 1 "	24 "	"	70
No. 352.	7×10 "	10×10 " 1 "	24 "	"	1 20
No. 353.	7×10 "	8× 8 " 1 "	24 "	"	1 20

OF RULED CROSS SECTION PAPER

No. 354.	8×10 inches,	10×10 to 1 inch, ruled in blue,	24 sheets	Each,	$0 50
No. 355.	8×10 "	6× 8 " 1 " " " "	24 "	"	50

SOLID SKETCH BLOCKS—PLAIN

No. 356. **"WHATMAN'S"** Paper.

	5×7	6×9	7×10	9×12	10×14	12×18	15×21
Each	$0 45	60	75	1 00	1 50	2 00	2 60

No. 357A. **"TEUTONIC"** Paper.

	5×7	6×9	7×10	9×12	10×14	12×18	15×21
Each	$0 40	50	60	70	1 00	1 25	1 50

No. 357B. **"CLASSIC"** Paper.

	5×7	6×9	7×10	9×12	10×14	12×18	15×21
Each	$0 12	15	20	25	35	45	75

SOLID SKETCH BLOCKS—BOUND

Leather Back and Corners, Cloth Sides, Pencil Loop

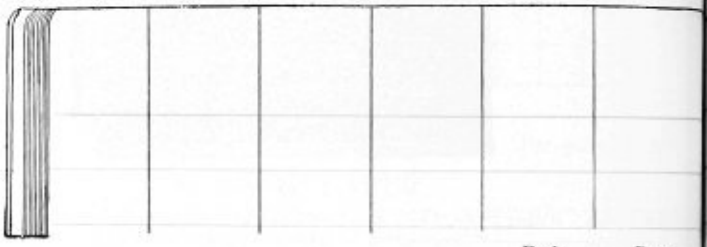
Sizes, inches,		5×7	7×10	9×12	10×14	15×21
No. 358.	**"WHATMAN'S"** Paper ..... Each,	$0 90	1 30	1 75	2 25	3 75
No. 359.	**"TEUTONIC"** Paper ..... "	80	1 25	1 50	2 00	3 50

ENGINEERS

All Field and Cross Section books manufactured by us are bound in sheepskin, correctly and waterproof.

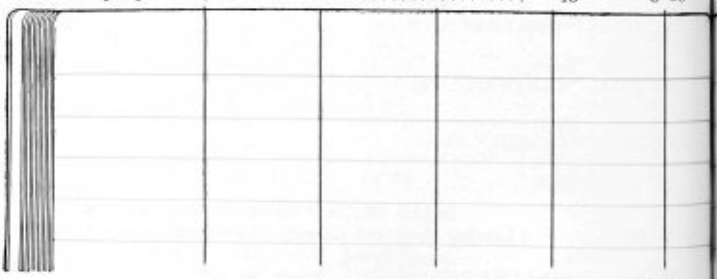
The tables in our Field and Transit Books have been selected with the greatest of the following: Tables of circular constants, angular constants, angles with the meri cosines, natural tangents and cotangents, radii, chord and tangent deflections, curves, elevation of the outer rail to be laid on curves, safe loads for wooden beams and

The tables contained in the different books vary, in accordance with the purpose



		Each	Dozen
No. 380	Level book 4½x7½ inches, 80 leaves, plain	$0 50	$5 50
No. 381	" " 4½x7½ inches, 60 " "	45	5 00

		Each	Dozen
No. 382	Field book, 4½x7½ inches, 80 leaves, plain	$0 50	$5 50
No. 383	" " 4½x7½ inches, 60 "	45	5 00

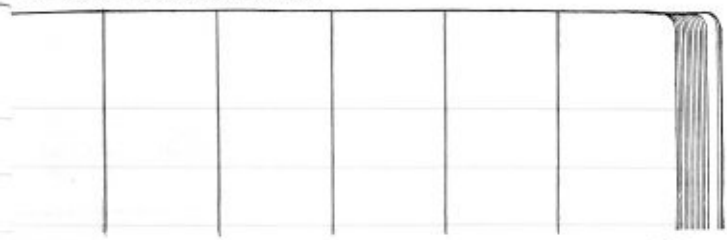


		Each	Dozen
No. 385	Field Book, 4½x7½ inches, 80 leaves, plain	$0 50	$5 50
No. 386	" " 4½x7½ inches, 60 " "	45	5 00

FIELD BOOKS

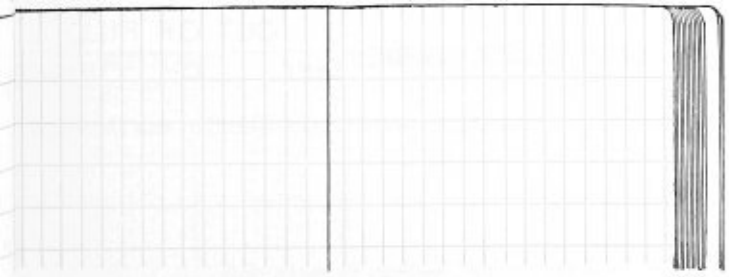
have round corners and round back, so as to lie flat when open. The rulings are spaced

care and were calculated unvariably by men foremost in the profession. They consist
dian formed by the points and quarter points of the compass. Natural sines and
tangents and externals to 1° curve, middle ordinates for binding rails to be laid on
columns, proportions of concrete, excavations and embankments.
for which the book is intended.



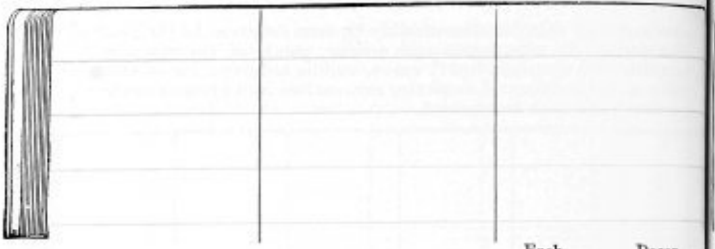
		Each	Dozen
No. 380T.	Same as No. 380, but with Van Auken's tables	$0 60	$6 50
No. 381T.	" " No. 381, " " " " "	55	6 00

		Each	Dozen
No. 382T.	Same as No. 382, but with Van Auken's tables	$0 60	$6 50
No. 383T.	" " No. 383, " " " " "	55	6 00

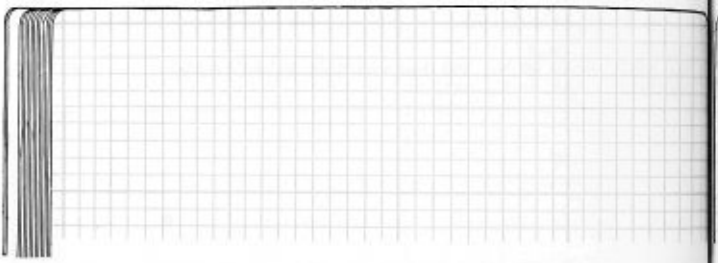


		Each	Dozen
No. 385T.	Same as No. 385, but with Van Auken's tables	$0 60	$6 50
No. 386T.	" " No. 386, " " " " "	55	6 00

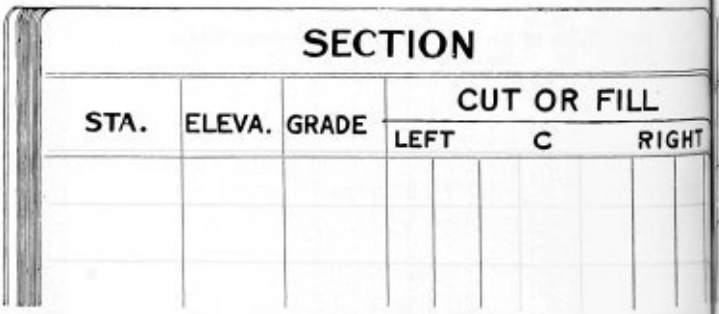
ENGINEERS'



		Each	Dozen
No. 390.	Transit Book, 4½×7½ in., 80 leaves, plain	$0 50	$5 50
No. 391.	" " 4½×7½ " 60 " "	45	5 00

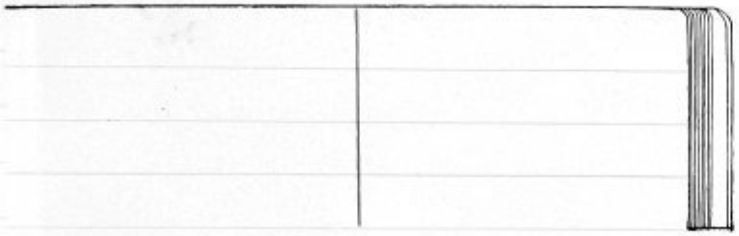


		Each	Dozen
No. 395.	Cross Section Book, 5½×7½ in., 80 leaves, plain	$0 70	$7 00
No. 396.	" " " 6½×8½ " 80 " "	90	9 00

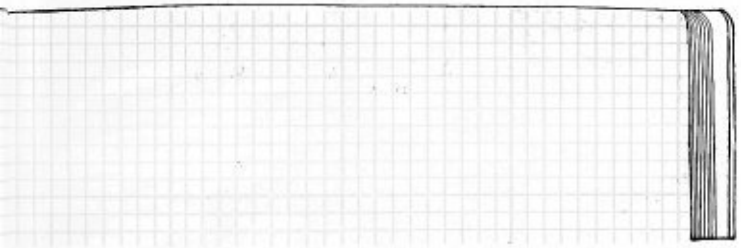


No. 400. Field Book, 5½×8 in., printed headings, 80 leaves, plain
No. 400. " " 5¼×8 " " " 80 leaves, but with Van Auken's

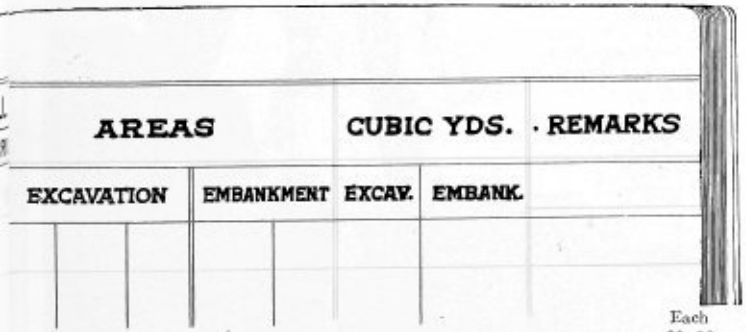
FIELD BOOKS



		Each	Dozen
No. 390T.	Same as No. 390, but with Van Auken's tables	$0 60	$6 50
No. 391T.	" " No. 391, " " " " "	55	6 00



		Each	Dozen
No. 395T.	Same as No. 395, but with Van Auken's tables	$0 80	$8 50
No. 396T.	" " No. 396, " " " " "	1 00	10 00

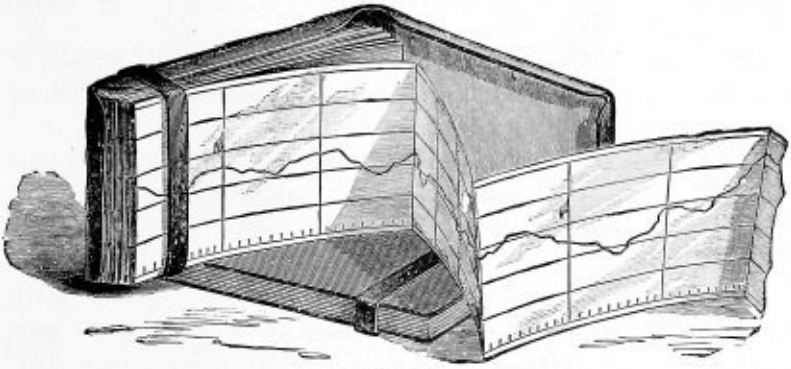


	Each	Dozen
	$0 90	$ 9 00
tables	1 00	10 00

STOCK HOUSE, FACTORY

PROFILE BOOKS

CONTINUOUS



No. 360.

Bound in Flexible Morocco Covers.

These books are folded like a map to replace the continuous rolls of Profile Paper, and the pages are mounted on muslin.

Each leaf, or two pages facing, contain six thousand feet—a "Section" as generally laid out for the construction of a road. The paper lays smooth and is of extra fine quality.

No. 360.	Plate A, 4×20 to one inch, 5½×8 inches. Printed in green.	12	25	50	100 miles.
	Each	$2 00	$3 20	$5 40	$9 60
No. 362.	Plate B, 4×30 to one inch, 4½×8 inches. Printed in green.	12	25	50	100 miles.
	Each	$2 00	$3 20	$5 40	$9 60

NOT CONTINUOUS

No. 365.

Stiff Morocco Covers

No. 365.	Plate A, 4×20 to one inch. Size of book, 7×10 inches. Printed in green. Bound in morocco.	25	50	100 leaves.
	Each	$1 90	$2 50	$3 50
No. 366.	Plate B, 4×30 to one inch. Size of book, 5½×9½ inches. Printed in green. Bound in morocco.	25	50	100 leaves.
	Each	$1 90	$2 50	$3 50

TYPEWRITER PAPERS

BONDS **ONION SKINS** **LINENS**

These papers are of exceptionally fine quality and manufactured expressly for typewriter work, our well assorted line enabling anyone to select a paper which will meet their requirements in quality and price.

Each ream of 500 sheets is put up in a strong, neat box, protecting the paper from damage, and is a very convenient receptacle in which to keep the paper.

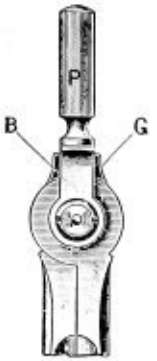
		Letter size 8×10½	Legal size 8½×13
No. 440.	Onion Skin, glazed, per ream of 500 sheets	$1 65	$2 25
No. 440A.	" " unglazed, " " "	1 65	2 25

No. 440 Onion Skin furnished in the following colors at same price: green, canary, pink, opaline and azure.

No. 441.	Manifolding Linen, Thin, per ream of 500 sheets	1 00	1 30
No. 441A.	" " Medium, " " "	1 30	1 60
No. 442.	Alcolyte " Thin, " " "	1 25	1 50
No. 442A.	" " Medium, " " "	160	1 85
No. 443.	Post Standard Linen, Laid or Wove, Extra Thin, per ream of 500 sheets	1 25	1 50
No. 443A.	Post Standard Linen, Thin, per ream of 500 sheets	1 45	1 70
No. 443B.	" " " Medium, " " "	1 80	2 05
No. 443C.	" " " Heavy, " " "	2 30	2 55
No. 444.	" " Bond, Thin, " " "	1 45	1 95
No. 444A.	" " " Medium, " " "	1 80	2 25
No. 444B.	" " " Heavy, " " "	2 30	2 70
No. 445.	Norwood " Thin, " " "	1 80	2 25
No. 445A.	" " Medium, " " "	2 25	2 65
No. 445B.	" " Heavy, " " "	2 80	3 25

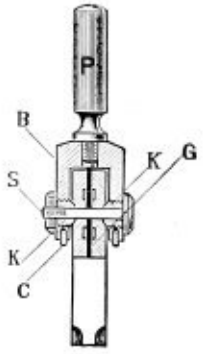
Samples of any of the above papers furnished on application

DRAWING INSTRUMENTS



Patent
Pivot Joint

Straightening
Device



Patent
Pivot Joint

The various instruments that we list on the following pages are unexcelled in workmanship, highest standard quality in material and finish, and below we append a short description of each grade to give our customers some idea of their superior quality, style and finish.

"PRIMO" DRAWING INSTRUMENTS

are manufactured exclusively for us. The workmanship is of the highest order and each instrument is carefully tested to insure its mechanical perfection before leaving the factory.

The material used is the highest tool steel and hard rolled German silver, highly polished.

We fully guarantee the **Primo Drawing Instruments** to be equal in quality to any make of high grade instruments and will be glad to submit them to your critical inspection and comparison, and ask your consideration when making your selection.

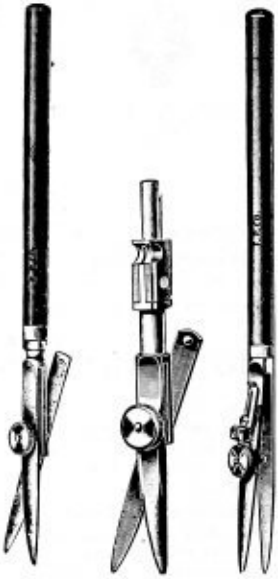
Of the numerous parts in drawing instruments the ruling pens, compasses and dividers are more frequently used than any others, so special care must be used in selecting the best quality that can be secured when making your purchase. We call your attention to the construction of the head in all **"Primo Drawing Instruments."** They are equipped with our **Patent Pivot Joint** with the center pin or bolt passing through both sides of the fork to handle, also the head of both divider legs. This pin is encased in a bushing which is cone shaped at the ends and bearing against the dividers, forms a pivot joint, such as is used in other makes of instruments that have Pivot Joints; so the pin passing through makes our **Primo Drawing Instruments** the most secure and firmest style of head used in instruments of precision. All compasses and dividers are equipped with **straightening device,** all genuine **Primo Drawing Instruments** are stamped **F. P. Co.**

"PRIMO" DRAWING INSTRUMENTS —Continued

Patent Needle Point Adjuster

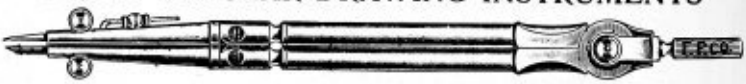
Each Compass, Bow Pen and Pencil is fitted with patent needle point adjuster. By opening the set screw, then turning the adjuster, the needle can be regulated either in or out to match the pencil or pen point. By so doing a closer adjustment can be secured than in the old way, where the needle is only clamped by a set screw. All **Primo** Brand Drawing Instruments have this patent feature.

The **Slide Release Attachment** on **Primo** Ruling Pens and pen parts to compasses. This enables the draughtsman to open the pen for cleaning without changing the adjustment. With this patent attachment the nut or thumb screw will not turn so as to alter the adjustment, as is the case in other ruling pen regulators.



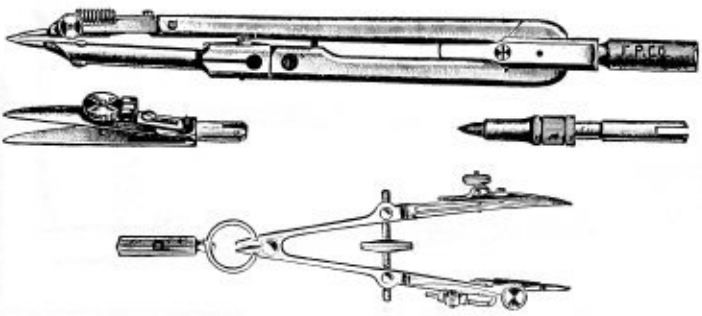
Primo Cross Joint pens have the same advantages as pens with slide release, quick opening for cleaning by simply turning the under blade of the pen, return the under blade to its original position, thus preserving the adjustment for width of lines.

PRIMO TUBULAR DRAWING INSTRUMENTS



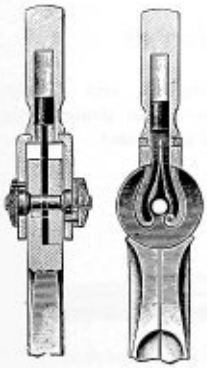
Owing to the fact that some draughtsmen prefer a tubular or cylindrical instrument to the other styles, we have listed compasses and dividers, also instruments in case, showing the chief points of the difference in construction and quality. All compasses are equipped with **patent pivot joint,** head having the pin running through as shown in the illustration above. Same is fitted with **straightening device**—all needle points have **patent adjustment.**

CORONA DRAWING INSTRUMENTS



The **"Corona"** Drawing Instruments are made of hard rolled German silver and highest grade tool steel points, same quality of material as is used in the manufacture of our **"Primo" Drawing Instruments,** only that the dividers and compasses are of a flat or oval construction. The heads of the dividers and compasses have a **patent pivot joint,** as shown in above illustration, and are equipped with **straightening device.** All Compasses, Bow Pencils and Bow Pens have adjustable needle point regulator. All genuine **"Corona"** Drawing Instruments are stamped **F. P. Co.**

SWISS DRAWING INSTRUMENTS



The Swiss drawing instruments are imported by us direct from Switzerland and are manufactured by Messrs. Kern & Co., each piece being stamped with their name or trade mark.

Compass Handle with Straightening Device. **Patent Needle Point Adjuster**

Patent applied for in the U. S. A.

EXCELSIOR DRAWING INSTRUMENTS

EXCELSIOR RULING PENS OF DIFFERENT STYLES

The Excelsior Drawing instruments are manufactured to suit the needs of the draughtsman who desires a first-class instrument in every respect, at a reasonable figure.

We call particular attention to the **patent straightening device** with which our compasses and dividers are equipped. This arrangement keeping the handle stationary at all times, no matter what the position assumed by the instrument.

These instruments are made of the best quality German silver and tool steel, carefully tempered and highly polished.

UNIVERSITY DRAWING INSTRUMENTS

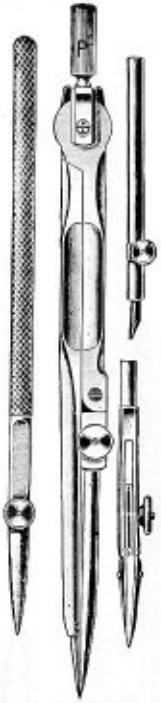
The **University** Drawing Instruments are the only similarly priced instruments that combine the leading features of the higher priced instruments with a good quality of material.

Pivot Joint

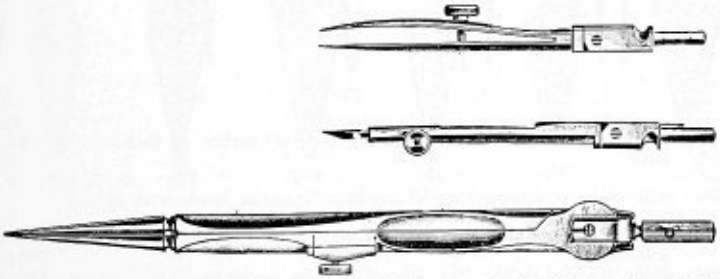
All compasses and dividers are equipped with **straightening device and pivot joint.**

COLLEGE DRAWING INSTRUMENTS

We recommend our "**College**" brand of drawing instruments to wear well and they are suitable for junior draftsmen learning their profession. They are used very extensively by High Schools, also Manual Training Schools, throughout the United States. As the demand for **flat** system drawing instruments is growing very rapidly we have added this line to our "**College**" line and list them in sets under Nos. 1081 to 1085, inclusive.



SCHOOL DRAWING INSTRUMENTS



Our School drawing instruments are the lowest priced instruments suitable for elementary grades of public schools. They are made in nickel plated and German silver finish. The flat line such as listed in sets Nos. 1132 to 1138 are German silver. All have **straightening devices** on compasses and dividers, ruling pens with release.

"PRIMO" DRAWING INSTRUMENTS

Highest quality hard rolled German silver, best English steel points, highly finished.

Each instrument stamped Primo or F. P. Co.

For description, see pages 69 and 70

Illustrations two-thirds size.

550 551 552 556 557 558

		Each
No. 550.	Ruling Pen, Ebony Handle, upper blade with spring 4½ inches	$1 10
551.	" " " " " " " " 5 "	1 20
552.	" " " " " " " " 5½ "	1 30
556.	Slide Release, Ruling Pen, Ebony Handle, upper blade with spring 4½ inches	1 50
557.	Slide Release, Ruling Pen, Ebony Handle, upper blade with spring 5 inches	1 60
558.	Slide Release, Ruling Pen, Ebony Handle, upper blade with spring 5½ inches	1 80

Aluminum handles furnished for Nos. 550, 551 and 552 at 15 cents additional.

Pens carefully sharpened and polished for 25 cents each

"PRIMO" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points highly finished.
Each instrument stamped Primo or F. P. Co.
Illustrations two-thirds size.

562 563 564 565 566 567

SWEDISH STYLE RULING PENS

		Each
No. 562.	Ebony Handle, upper blade with spring 5 inches	$1 50
563.	" " " " " " 6 "	1 60
564.	" " " " " " 7 "	1 70
565.	Aluminum Handle, upper blade with spring 5 inches	1 70
566.	" " " " " " 6 "	1 80
567.	" " " " " " 7 "	1 90

Pens carefully sharpened and pointed for 25 cents each

"PRIMO" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished.

Each instrument stamped Primo or F. P. Co. Illustrations two-thirds size.

577

578

579

No. 577. Steel Spring Bow Divider, 3½ inches, metal handle.....Each, $2 00
578. " " " Pencil, 3½ " " " ..... " 2 50
579. " " " Pen, 3½ " " " ..... " 2 50
581. Set of Bows, Nos. 577, 578, 579, in morocco case, per set..... 8 00

584

586

587

No. 584. Steel Spring Bow Divider, 3½ inches, center screw, metal handle. Each, $2 40
586. " " " Pencil, 3½ " " " " " " " 3 00
587. " " " Pen, 3½ " " " " " " " 3 00
588. Set of Bows, Nos. 584, 586, 587, in morocco case, per set..... 9 50

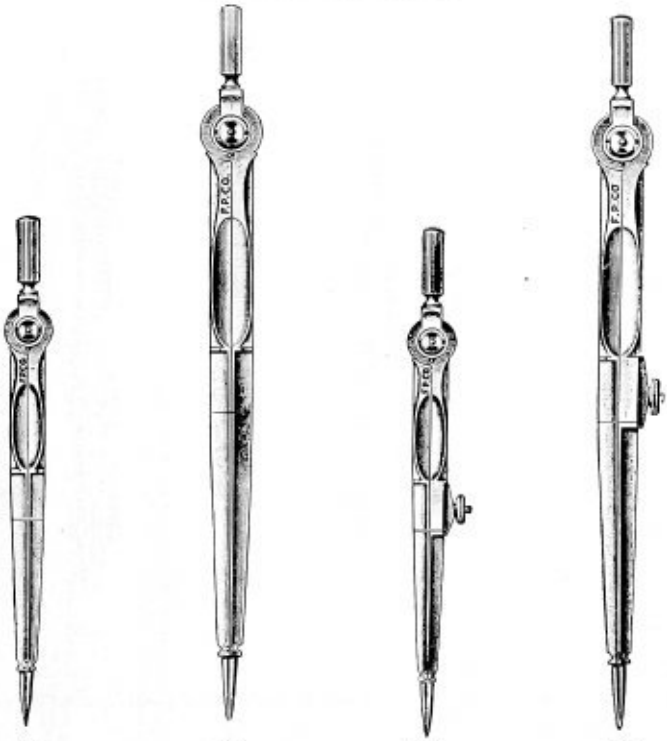
Bow Pens and Pencils are fitted with patent needle regulator.

"PRIMO" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished.

Each instrument stamped Primo or F. P. Co.

Illustrations two-thirds size.



592 593 594 596

		Each
No. 592.	Plain Dividers, 4½ inches, patent pivot joint and straightening device.	$2 25
593.	" " 6 " " " " " " " "	2 85
594.	Hair-Spring Dividers, 4½ inches, patent pivot joint and straightening device	3 00
596.	Hair-Spring Dividers, 6 inches, patent pivot joint and straightening device	3 60

"PRIMO" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished.

Each instrument stamped Primo or F. P. Co.

Illustrations two-thirds size.

604

605

606

		Each
No. 604.	Compasses, 4½ inches, fixed needle and pencil point, patent pivot joint and straightening device	$4 00
605.	Compasses, 4½ inches, fixed needle and pen point, patent pivot joint and straightening device	4 00
606.	Compasses, 4½ inches, fixed needle point, pen and pencil points, patent pivot joint and straightening device	5 50

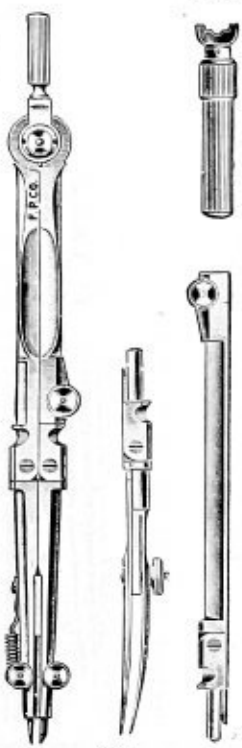
Above compasses equipped with patent adjustable needle point regulator.

"PRIMO" DRAWING INSTRUMENTS —Continued

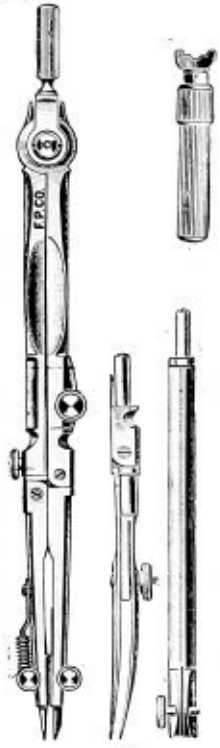
Highest quality hard rolled German Silver, best English steel points, highly finished.

Each instrument stamped Primo or F. P. Co.

Illustrations two-thirds size.



611



612

		Each
No. 611.	Compasses, 6 inches, with fixed needle point, pencil, pen point and lengthening bar, patent pivot joint and straightening device	$7 40
612.	Compasses, 6 inches, hairspring with fixed needle point, pen point and lengthening bar, patent pivot and straightening device	8 40

All pen parts have the slide catch, thus allowing the pen to be opened for cleaning without changing the adjustment.

Above compasses equipped with patent adjustable needle point regulator.

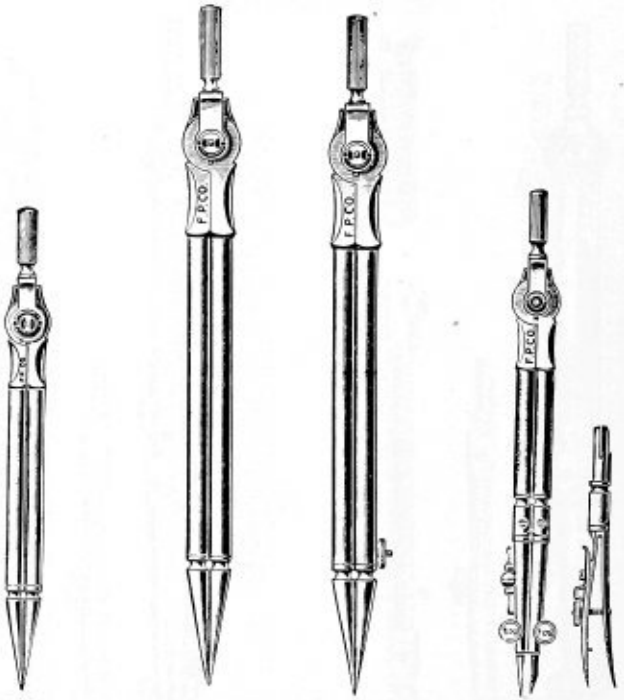
"PRIMO" DRAWING INSTRUMENTS —Continued

Round System

Highest quality hard rolled German silver, best English steel points, highly finished.

Each instrument stamped Primo or F. P. Co. For description, see page 70

Illustrations two-thirds size.



616 617 618 619

		Each
No. 616.	Plain Dividers, 4½ inches, patent pivot joint head with straightening device	$1 80
617.	Plain Dividers, 6 inches, patent pivot joint head with straightening device	2 50
618.	Hairspring Dividers, 6 inches, patent pivot joint head with straightening device	3 00
619.	Compasses, 4½ inches, with fixed needle point, pen and pencil point, patent pivot joint and straightening device	5 00

For above instruments in sets, see pages 88 and 89.

Above compasses equipped with patent adjustable needle point regulator.

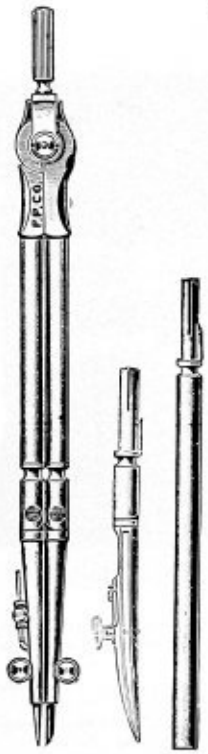
"PRIMO" DRAWING INSTRUMENTS —Continued

Round System

Highest quality hard rolled German silver, best English steel points, highly finished.

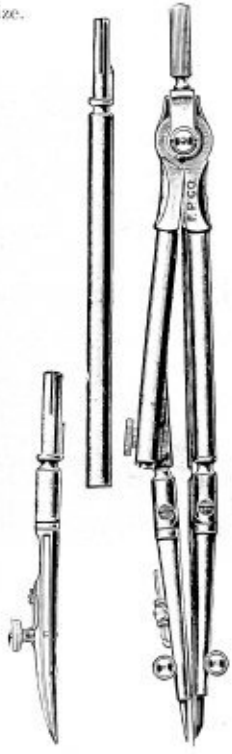
Each instrument stamped Primo or F. P. Co.

Illustrations two-thirds size.



621

Full-size section of pivot joint



622

		Each
No. 621.	Compasses, 6 inches, with fixed needle point, pen and pencil point and lengthening bar, patent pivot joint head and straightening device....	$6 00
622.	Compasses, 6 inches, hairspring fixed needle point, pen and pencil points, and lenthening bar, patent pivot joint head and straightening device.....	7 25

Dotting Instrument with pen part to fit above compasses for drawing dotted circles, see No. 826. For above instruments in sets, see pages 88 and 89.

Above compasses equipped with patent adjustable needle point regulator.

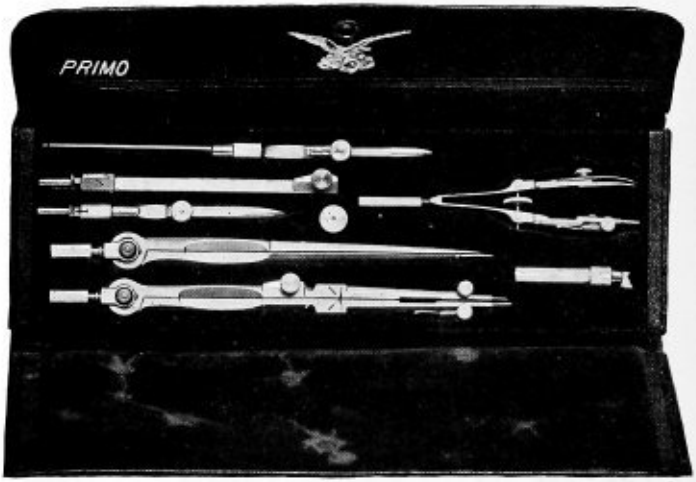
"PRIMO" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished.

In pocket book style cases, green silk velvet lined

Each instrument stamped Primo or F. P. Co.

For description, see pages 69-70



No. 625

No. 625. Containing:—
No. 557 Ruling Pen, 5 inches, with spring and slide release, ebony handle.
No. 587 Steel Spring Bow Pen, 3½ inches, metal handle, center screw adjustment.
No. 593 Plain Divider, 6 inches, patent pivot joint and straightening device.
No. 611 Compass, 6 inches, with fixed needle point, pen and pencil point, lengthening bar and straightening device.
No. 722 Center tack, ⅜ inches, German silver.
No. 717 Combination key and box of leads.
Per set.....$16 50

No. 626. Containing:—
Same as No. 625 with hairspring divider No. 596 in place of No. 593.
Per set.....$17 25

Above compasses and pen and pencil bows equipped with patent adjustable needle point regulator.

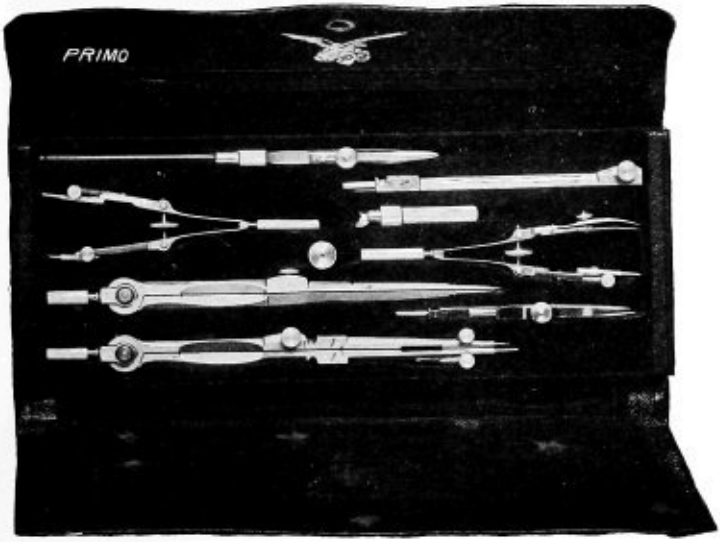
"PRIMO" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished.

In pocket book style cases, green silk velvet lined

Each instrument stamped Primo or F. P. Co.

For description, see pages 69-70



No. 628

No. 627. Containing:—
- No. 557 Ruling Pen, 5 inches, with spring and slide release, ebony handle.
- No. 586 Steel Spring Bow Pencil, 3½ inches, metal handle center screw.
- No. 587 Steel Spring Bow Pen, 3½ inches, metal handle center screw.
- No. 593 Divider, 6 inches, patent pivot joint and straightening device.
- No. 611 Compass, 6 inches, with fixed needle point, pen and pencil point, lengthening bar and straightening device.
- No. 772 Center Tack, ⅛ inches, German silver.
- No. 717 Combination key and box of leads.

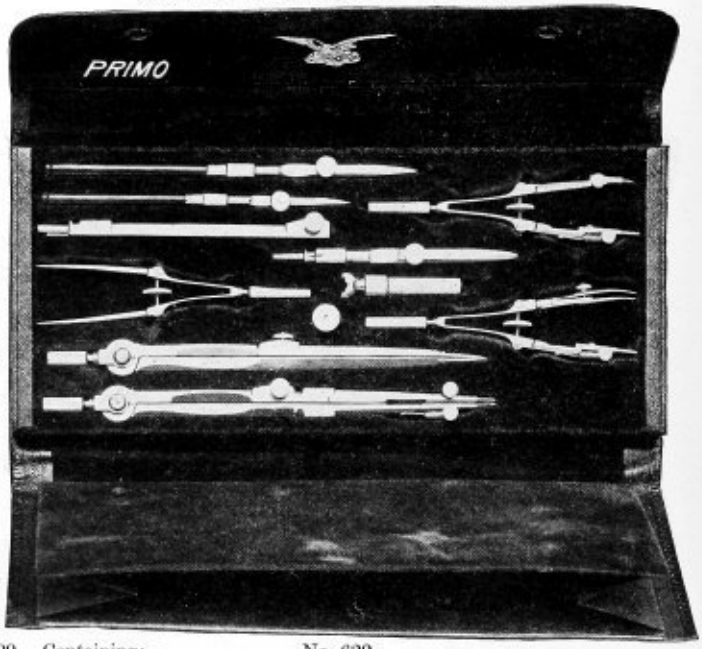
Per set.....$19 25

No. 628. Containing same as No. 627, with No. 596 hairspring divider in place of No. 593.
Per set.....$20 00

Above compasses and pen and pencil bows equipped with patent adjustable needle point regulator.

"PRIMO" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished
In pocket book style cases, green silk velvet lined
Each instrument stamped Primo or F. P. Co.



No. 629. Containing:— No. 629

No. 556 Ruling Pen, 4½ inches, with spring and slide release, ebony handle.
No. 558 Ruling Pen, 5½ inches, with spring and slide release, ebony handle.
No. 584 Steel Spring Bow Divider, 3¼ inches, center screw, metal handle.
No. 586 Steel Spring Bow Pencil, 3½ inches, center screw, metal handle.
No. 587 Steel Spring Bow Pen, 3½ inches, center screw, metal handle.
No. 596 Hairspring Divider, 6 inches, patent pivot joint and straightening device.
No. 611 Compass, 6 inches, with fixed needle point, pencil pen points, and lengthening bar, patent pivot joint and straightening device.
No. 717 Combination key and box of leads.
No. 722 Center Tack, ⅜ inches, German silver. Per set.....$24 00

No. 630. Containing same as No. 629 but with Hairspring Compass No. 612 in place of No. 611. Per set.....$25 00

Above sets with Spring Bows Nos. 577, 578, 579, having outside thumb screw, $1.00 less per set.

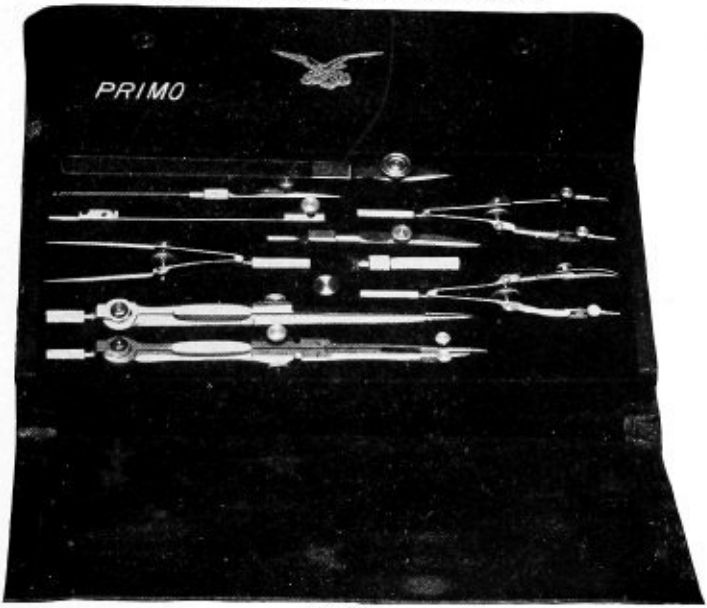
Above compasses and pen and pencil bows equipped with patent adjustable needle point regulator.

"PRIMO" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished

In pocket book style cases, green silk velvet lined

Each instrument stamped Primo or F. P. Co.



No. 634

No. 633. Containing:—

- No. 557 Ruling Pen, 5 inches, with spring and slide release, ebony handle.
- No. 563 Swedish Detail Pen, 6 inches, with spring, ebony handle.
- No. 584 Steel Spring Bow Divider, 3½ inches, center screw, metal handle.
- No. 586 Steel Spring Bow Pencil, 3½ inches, center screw, metal handle.
- No. 587 Steel Spring Bow Pen, 3½ inches, center screw, metal handle.
- No. 596 Hairspring Divider, 6 inches, patent pivot joint and straightening device.
- No. 611 Compass, 6 inches, with fixed needle point, pencil and pen points, lengthening bar, patent pivot joint and straightening device.
- No. 722 Center Tack, ⅜ inches.
- No. 717 Combination key and box of leads. Per set.....$25 00

No. 634. Containing same as No. 633, but with Hairspring Compass No. 612 in place of No. 611.
Per set.....$26 00

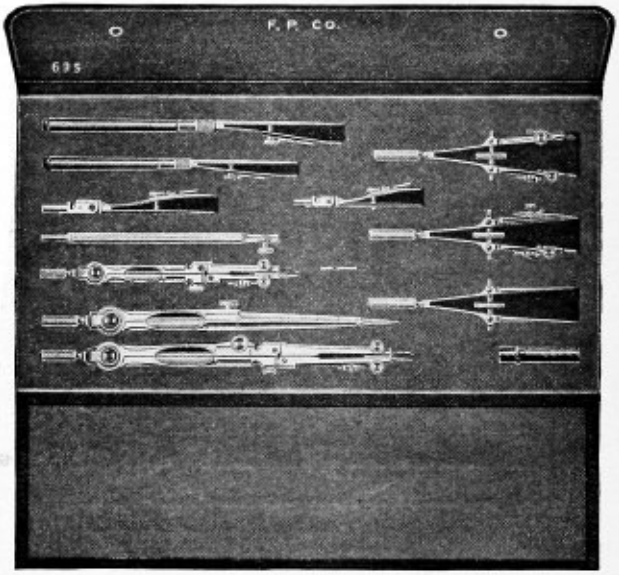
Above compasses and pen and pencil bows equipped with patent adjustable needle point regulator.

"PRIMO" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished

In pocket book style cases, green velvet silk lined

Each instrument stamped Primo or F. P. Co.



No. 635

No. 635. Containing:—

No. 556 Ruling Pen, 4½ inches, ebony handle, slide release.
No. 557 Ruling Pen, 5 inches, ebony handle, slide release.
No. 563 Swedish Detail Pen, 6 inches, with springback, ebony handle.
No. 584 Steel Spring Bow Dividers, 3½ inches, metal handle, centerscrew.
No. 586 Steel Spring Bow Pencil, 3½ inches, metal handle, center screw.
No. 587 Steel Spring Bow Pen, 3½ inches, metal handle, center screw.
No. 596 Hairspring Divider, 6 inches, patent pivot joint and straightening device.
No. 606 Compass, 4½ inches, fixed needle point, pen and pencil point, patent pivot joint and straightening device.
No. 612 Hairspring Compass, 6 inches, with fixed needle point, pen, pencil point and lengthening bar, patent pivot joint and straightening device.
No. 717 Combination Key and box of leads.
No. 722 Center Tack, ¾ inches, German silver.

Per set.....$30 00

Above compasses and pen and pencil bows equipped with patent adjustable needle point regulator.

"PRIMO" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished

In pocket book style cases, green silk velvet lined

Each instrument stamped Primo or F. P. Co.

No. 637

No. 637. Containing:—

No. 556 Ruling Pen, 4½ inches, with spring and slide release, ebony handle.
No. 557 Ruling Pen, 5 inches, with spring and slide release, ebony handle.
No. 563 Swedish Detail Pen, 6 inches, with spring, ebony handle.
No. 584 Steel Spring Bow Dividers, 3½ inches, center screw, metal handle.
No. 586 Steel Spring Bow Pencil, 3¼ inches, center screw, metal handle.
No. 587 Steel Spring Bow Pen, 3¼ inches, center screw, metal handle.
No. 596 Hairspring Divider, 6 inches, patent pivot joint and straightening device.
No. 604 Compass, 4¼ inches, fixed needle and pencil points, patent pivot joint and straightening device.
No. 605 Compass, 4½ inches, fixed needle and pen points, patent pivot joint and straightening device.
No. 612 Compass, 6 inches, with Hairspring fixed needle point, pen and pencil points, lengthening bar, patent pivot joint and straightening device.
No. 717 Combination key and box of leads.
No. 722 Center Tack, ¾ inches, German silver.
No. 916 Miniature Beam Compass with two steel points, pen, pencil and needle points, and micrometer adjustment.

Per set..... $40 00

Above compasses and pen and pencil bows equipped with patent adjustable needle point regulator.

Any other assortment in cases furnished to order at short notice

"PRIMO" DRAWING INSTRUMENTS -Continued

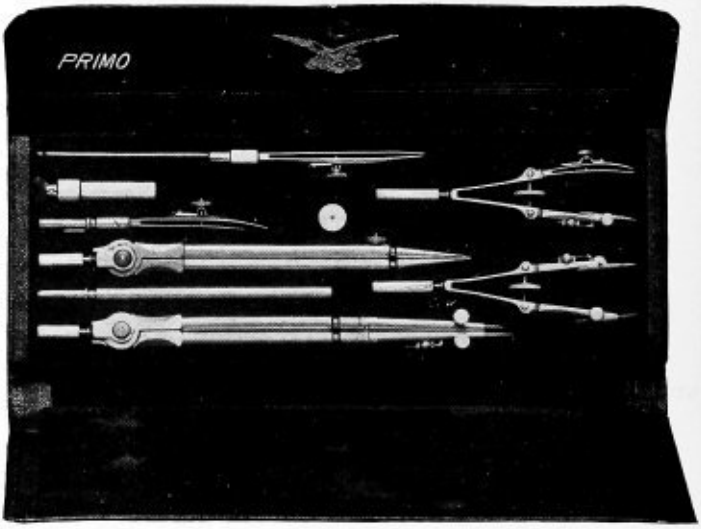
Round System

Highest quality hard rolled German silver, best English steel points, highly finished

In pocket book style case, green silk velvet lined

For description, see page 70

Each instrument stamped Primo or F. P. Co.



No. 640. Containing:— No. 640

No. 557 Ruling Pen, 5 inches, with spring and slide release, ebony handle.
No. 661 Steel Spring Bow Pencil, 3½ inches, center screw, metal handle.
No. 662 Steel Spring Bow Pen, 3½ inches, center screw, metal handle.
No. 618 Hairspring Divider, 6 inches, patent pivot joint and straightening device
No. 621 Compass, 6 inches, with fixed needle point, pen and pencil point, lengthening bar, patent pivot joint and straightening device.
No. 722 Center Tack, ¾ inches.
Key and box of leads.

Per set..... ...$18 00

Above compasses and pen and pencil bows equipped with patent adjustable needle point regulator.

Any other assortment in cases made to order at short notice

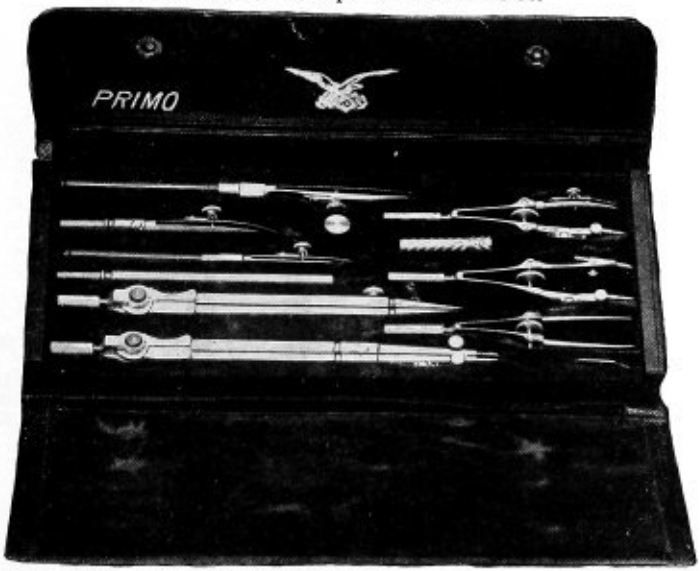
"PRIMO" DRAWING INSTRUMENTS

Round System

Highest quality hard rolled German silver, best English steel points, highly finished

In pocket book style cases, green silk velvet lined

Each instrument stamped Primo or F. P. Co.



No. 642

No. 642. Containing:—
- No. 557 Ruling Pen, 5 inches, with spring and slide release, ebony handle.
- No. 558 Ruling Pen, 5½ inches, with spring and slide release, ebony handle.
- No. 660 Steel Spring Bow Divider, 3½ inches, center screw, metal handle.
- No. 661 Steel Spring Bow Pencil, 3½ inches, center screw, metal handle.
- No. 662 Steel Spring Bow Pen, 3½ inches, center screw, metal handle.
- No. 618 Hairspring Divider, 6 inches, patent pivot joint and straightening device.
- No. 621 Compass, 6 inches, with fixed needle point, pen and pencil point, lengthening bar, patent pivot joint and straightening device.
- No. 722 Center Tack.
- Key and box of leads.

Per set..... $21 00

No. 644. Containing same as No. 642 but with Hairspring Compass No. 622 in place of Compass No. 621.
Per set..... 22 00

Above compasses and pen and pencil bows equipped with patent adjustable needle point regulator.

"CORONA" DRAWING INSTRUMENTS

Highest quality hard rolled German silver, best English steel points, highly finished

Each instrument stamped Corona or F. P. Co.

For description, see page 71

Illustrations two-thirds size

650 651 652 656 657 658

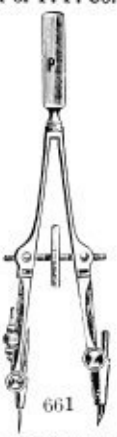
		Each
No. 650.	Ruling Pens, 4½ inches, with spring back **slide release**, metal handle	$1 40
651.	" " 5 " " " " " " " " "	1 50
652.	" " 5½ " " " " " " " " "	1 60
656.	" " 4½ " with **cross joint, aluminum handle**	1 50
657.	" " 5 " " " " " " "	1 60
658.	" " 5½ " " " " " " "	1 75

Pens carefully sharpened and polished for 25 cents each

"CORONA" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished
Each instrument stamped Corona or F. P. Co. Illustrations two-thirds size

660

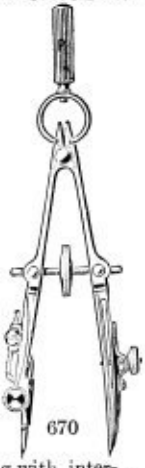

661

662

No 660. Steel Spring Bow Divider, 3½ inches, center screw, metal handle, with interchangeable needle points ..... Each, $2 40
661. Steel Spring Bow Pencils, 3½ inches, center screw, metal handle.. " 3 00
662. Steel Spring Bow Pen, 3½ inches, center screw, metal handle..... " 3 00
663. Set of Bows Nos. 660, 661, 662, in morocco case, silk velvet lined.. " 9 50

668

669


670

No. 668. Bow Divider, 3½ inches, center screw, circular spring with interchangeable needle point. ..... Each, $2 40
669. Bow Pencil, 3½ inches, center screw, circular spring ..... " 3 00
670. Bow Pen, 3½ " " " " " ..... " 3 00
671. Set of Bows Nos. 668, 669, 670, in morocco case, silk velvet lined. " 9 50

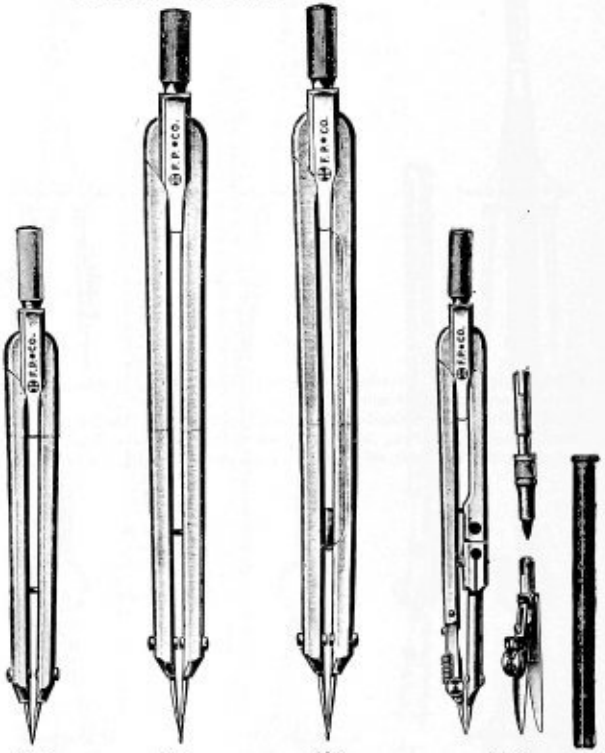
Bow Pens and Pencils are fitted with patent needle regulator.

"CORONA" DRAWING INSTRUMENTS —Continued

Flat System

Highest quality hard rolled German silver, best English steel points, highly finished

Each instrument stamped Corona or F. P. Co.



692 693 696 706

		Each
No. 692.	Plain Divider, 4½ inches, interchangeable steel points and straightening device	$2 25
693.	Plain Divider, 6 inches, interchangeable steel points and straightening device	2 70
696.	Hairspring Divider, 6 inches, interchangeable steel points and straightening device	3 00
704.	Compasses, 4½ inches, with fixed pencil point and straightening device	4 50
705.	Compasses, 4½ inches, with fixed pen point and straightening device	4 50
706.	" 4½ " " interchangeable needle point, pencil, pen, with slide release catch, metal handle, and straightening device	5 25

Above compasses equipped with patent adjustable needle point regulator.

"CORONA" DRAWING INSTRUMENTS —Continued

Flat System

Highest quality hard rolled German silver, best English steel points, highly finished

Each instrument stamped Corona or F. P. Co.

Illustrations two-thirds size

711

712

		Each
No. 711.	Compasses, 6 inches, interchangeable needle point, pen, pencil points, lengthening bar, metal handle, combination key and box of leads	$6 00
712.	Hairspring Compasses, 6 inches, interchangeable needle point, pen, pencil points, lengthening bar, metal handle, combination key and box of leads	7 25

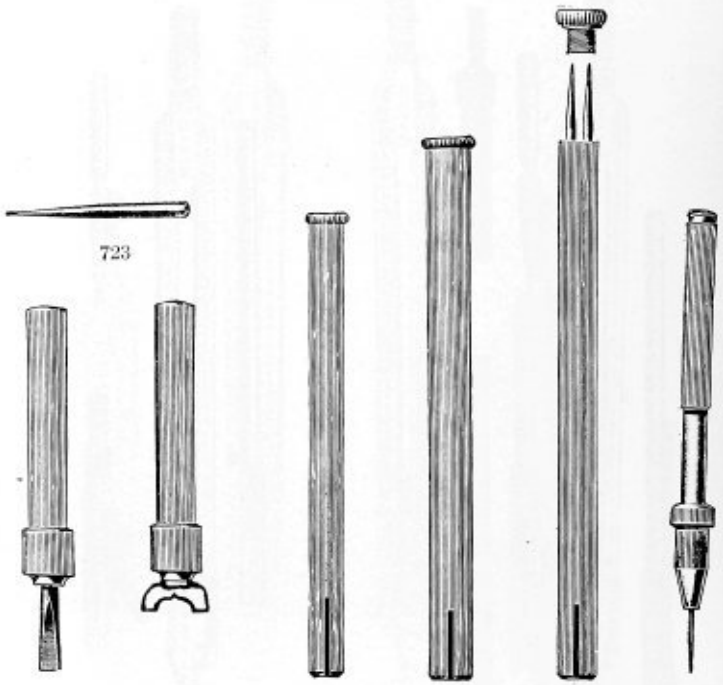
Above dividers equipped with straightening device, patent micrometer, adjustment on needle points, slide catch on pen parts, milled metal handle holding reserve stock of needles, handle to fit pen part for ruling straight lines.

Above compasses equipped with patent adjustable needle point regulator.

"CORONA" DRAWING INSTRUMENTS —Continued

KEYS AND HANDLES, ETC.

Illustrations full size



		Each
No. 716.	Combination key and box of leads to fit Corona Drawing Instruments. .	$0 25
717.	" " " " " Primo " " " . .	25
718.	Milled metal handle, 2½ inches long, to fit pen and pencil parts of compass No. 706, with extra needles	40
719.	Milled metal handle, 3¼ inches long, to fit pen and pencil parts of Compasses Nos. 711 and 712, with extra needles	50
720.	Pricker with milled metal handle and clutch to hold needle	75
721.	Centertack, German silver, ⅜-inch	15
722.	" " " ⅜ "	15
723.	Needle points for compasses	15

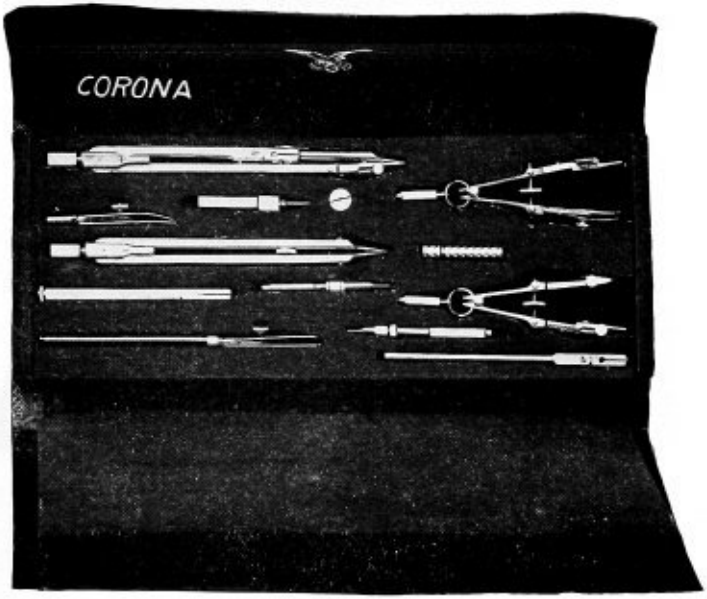
"CORONA" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished

In pocket book style cases, chamois lined Style B

Each instrument stamped Corona or F. P. Co.

For description, see page 71



No. 727

No. 727. Containing:—

No. 651 Ruling pen, 5 inches, springback slide release, metal handle.
No. 669 Bow Pencil, 3½ inches, center screw, circular spring, metal handle.
No. 670 Bow Pen, 3½ inches, center screw, circular spring, metal handle.
No. 696 Hairspring Divider, 6 inches, with straightening device.
No. 711 Compass, 6 inches, fixed needle point, pen and pencil points, lengthening bar and straightening device.
No. 716 Combination key and box of leads.
No. 719 Milled metal handle to fit pen part of No. 711, when used as a ruling pen.
No. 720 Pricker milled metal handle with clutch to hold needle.
No. 722 Center tack, ⅞ inches, German silver.

In chamois lined pocket book case, style B. Per set.....$19 00

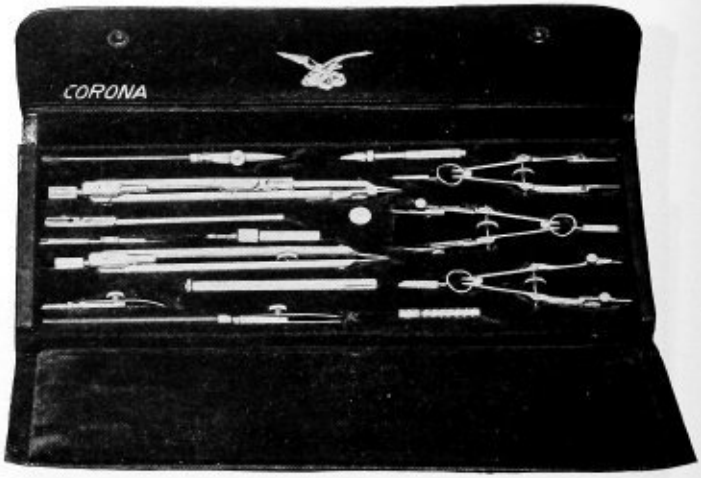
Above compasses and pen and pencil bows equipped with patent adjustable needle point regulator.

"CORONA" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished

In pocket book style cases, chamois lined Style B

Each instrument stamped Corona or F. P. Co.



No. 729

No. 729. Containing:—

No. 650 Ruling Pen, 4½ inches, spring back, slide release, metal handle.
No. 652 Ruling Pen, 5½ inches, spring back, slide release, metal handle.
No. 668 Bow Dividers, 3½ inches, center screw, circular spring, metal handle.
No. 669 Bow Pencil, 3½ inches, center screw, circular spring, metal handle.
No. 670 Bow Pen, 3½ inches, center screw, circular spring, metal handle.
No. 696 Hairspring Divider, 6 inches, with straightening device.
No. 711 Compass, fixed needle point, pen and pencil points, lengthening bar and straightening device.
No. 716 Combination key and box of leads.
No. 719 Milled metal handle to fit pen part of No. 711, when used as a ruling pen.
No. 720 Pricker milled metal handle, with clutch to hold needle.
No. 722 Center Tack, ¾ inches, German silver.
In chamois lined pocket book case, style B. Per set..... $23 00

No. 730. Contains same as No. 729, but with Hairspring Compass No. 712 in place of No. 711.
Per set..... 24 25

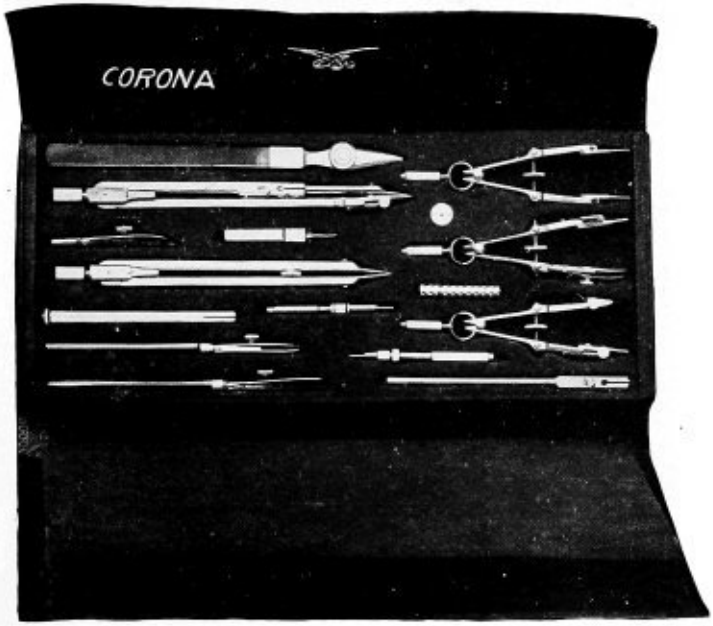
Above compasses and pen and pencil bows equipped with patent adjustable needle point regulator.

"CORONA" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished

In pocket book style cases, chamois lined Style B

Each instrument stamped Corona or F. P. Co.



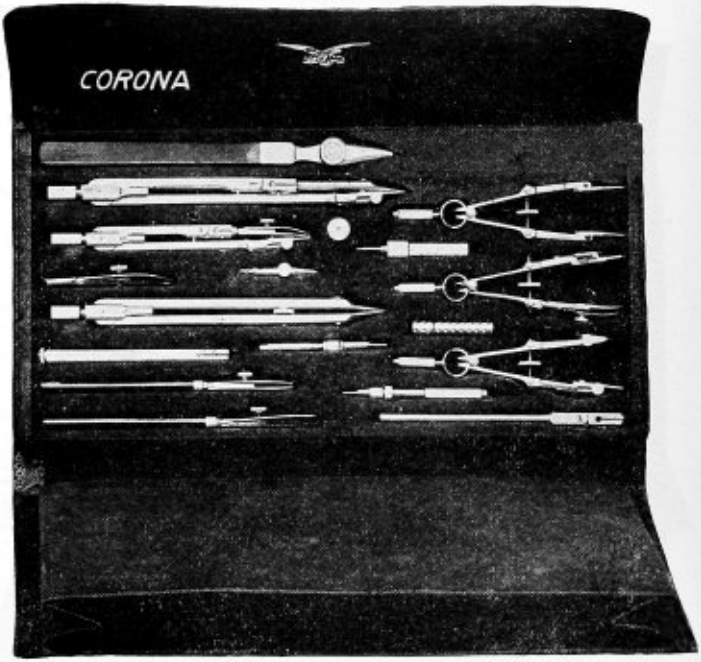
No. 734

No. 734. Containing:—
No. 651 Ruling Pen, 5 inches, slide release, metal handle.
No. 563 Swedish Detail Pen, 6 inches, springback ebony handle.
No. 668 Bow Dividers, 3½ inches, center screw, circular spring, metal handle.
No. 669 Bow Pencil, 3½ inches, center screw, circular spring, metal handle.
No. 670 Bow Pen, 3½ inches, center screw, circular spring, metal handle.
No. 696 Hairspring Divider, 6 inches, with straightening device.
No. 712 Hairspring Compass, 6 inches, interchangeable needle pen, pencil points, lengthening bar and straightening device.
No. 716 Combination key and box of leads.
No. 719 Milled metal handle to fit pen and pencil part of Compass 712.
No. 720 Pricker milled metal handle, with clutch to hold needle.
No. 722 Centertack, ⅜ inches, German silver.
In chamois lined pocket book case, style B. Per set $25 00

Above compasses and pen and pencil bows equipped with patent adjustable needle point regulator.

"CORONA" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished
Each instrument stamped Corona or F. P. Co.



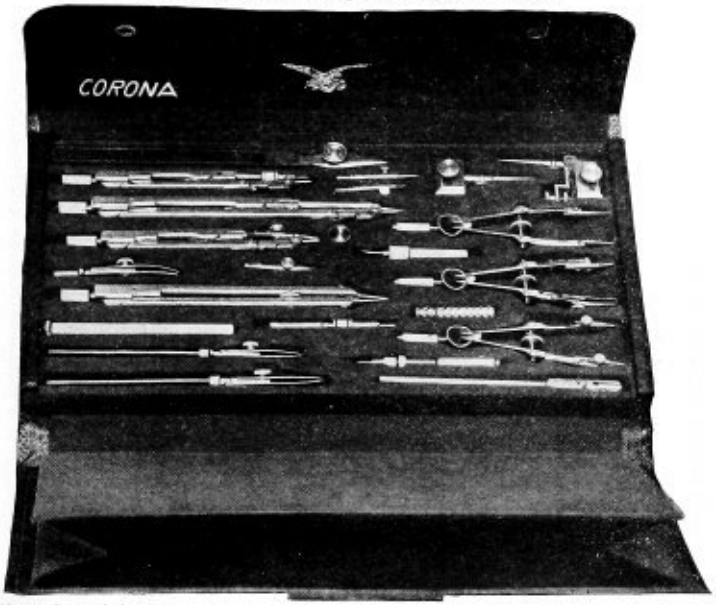
No. 735. Containing:—
- No. 650 Ruling Pen, 4½ inches, slide release, metal handle.
- No. 651 Ruling Pen, 5 inches, slide release, metal handle.
- No. 563 Swedish Detail Pen, 6 inches, spring back, ebony handle.
- No. 668 Bow Dividers, 3½ inches, center screw, circular spring, metal handle.
- No. 669 Bow Pencil, 3½ inches, center screw, circular spring, metal handle.
- No. 670 Bow Pen, 3½ inches, center screw, circular spring, metal handle.
- No. 696 Hairspring Divider, 6 inches, with straightening device.
- No. 706 Compass, 4½ inches, with pen, pencil points, and metal handle, straightening device.
- No. 711 Compass, 6 inches, fixed needle point, pen, pencil points, lengthening bar and straightening device.
- No. 716 Combination key and box of leads.
- No. 718 milled metal handle to fit pen part of Compass No. 706.
- No. 719 milled metal handle to fit pen part of Compass No. 711.
- No. 720 Pricker milled metal handle, with clutch to hold needle.
- No. 722 Center Tack, ¾ inches, German silver.

In chamois lined pocket book case, style B. Per set..... $29 00

Above compasses and pen and pencil bows equipped with patent adjustable needle point regulator.

"CORONA" DRAWING INSTRUMENTS —Continued

Highest quality hard rolled German silver, best English steel points, highly finished
Each instrument stamped Corona or F. P. Co.



No. 737. Containing:—
- No. 563 Swedish Detail Pen, 6 inches, ebony handle.
- No. 650 Ruling Pen, 4½ inches, slide release, metal handle.
- No. 651 Ruling Pen, 5 inches, slide release, metal handle.
- No. 668 Bow Divider, 3½ inches, center screw, circular spring, metal handle.
- No. 669 Bow Pencil, 3½ inches, center screw, circular spring, metal handle.
- No. 670 Bow Pen, 3½ inches, center screw, cricular spring, metal handle.
- No. 696 Hairspring Divider, 6 inches, with straightening device.
- No. 704 Compass, 4½ inches, fixed pencil point and straightening device.
- No. 705 Compass, 4½ inches, fixed pencil point and straightening device.
- No. 711 Compass, 6 inches, fixed needle point, pen, pencil points, lengthening bar and straightening device.
- No. 716 Combination key and box of leads.
- No. 719 Milled metal handle to fit pen part of Compass No. 711.
- No. 720 Pricker milled metal handle, with clutch to hold needle.
- No. 722 Center tack, ⅜ inches, German silver.
- No. 916 Miniature Beam Compass with two steel points, pen, pencil, needle points and micrometer adjustment.

In chamois lined pocket book case. Per set..... $39 00

Above compasses and pen and pencil bows equipped with patent adjustable needle point regulator.

GENUINE SWISS INSTRUMENTS

Made of German silver and best English tempered steel

For description, see page 71

Illustrations two-thirds size

740 741 742 744 745 746

		Each
No. 740.	Ruling Pen, Ebony Handle, upper blade with spring, 4½ inches	$1 15
741.	" " " " " " " " 5 "	1 25
742.	" " " " " " " " 5½ "	1 40
744.	" " Ivory Handle, with pin and joint, 4¾ inches	1 60
745.	" " " " " " " 5½ "	1 90
746.	" " " " " " " 6½ "	2 00

Nos. 740, 741 and 742 furnished with aluminum handles if desired for 15 cents additional.

Pens carefully sharpened and polished for 25 cents each

Errata Sheet for 1910 Catalogue

Page	9	No.	5a should be 6 x 9, not 9 x 9		
"	16	"	51 Jumbo	per 25 yds.	10 yds.	yard
			31 in. wide	$ 5.75	2.25	.24
			36 "	6.75	2.85	.33
			62 "	11.50	4.50	.50
"	22	"	126 Tracing Cloth, 500 sheets not printed, should read $37.50, in place of 22.50			
"	26	"	268 should read 168			
"	31	"	187 price of 50 yards 30 inches should read $5.50			
"	32	"	101 should read 191			
"	33	"	215 the second size should read 36 in.			
"	37	"	227 the second size should read 36 in.			
"	40	"	240a 16 x 22 should read 18 x 22			
"	43	"	284e should read 248e			
"	58		Cut marked No. 304 should read 305			
"	61	"	351 and 355 should read 8 x 8 not 6 x 8			
"	86	"	635 illustration should show swedish ruling pen No. 563 in addition to two ruling pens			
"	97	"	734 illustration should show only one ruling pen No. 651 in addition to swedish pen			
"	137	"	1040 ruling pen should read 1060			
"	138	"	1663a should read 1063a			
"	143-144		Cut should show circular spring bows not regular bows, see illustrations 1008a, 1009a, 1010a			
"	144	No.	1085 should read with hair spring divider in place of plain divider			
"	151	"	1126 illustration should be numbered 1127			
"	175	"	1370 map measure should read $2.00 not 7.00			
"	184	"	1443 should read 6 in. not 5 in.			
"	184	"	1444b should read 20 in. not 21 in.			
"	218	"	1807 steel straight edge, second size should be 18"			
"	229		Amber curves No. 24 $1.00			
"	304	"	3111c ink holders should read per box of 6, $0.50			
"	308	"	3205, 25 meters should read each $10.25			
"	312	"	3233, 100 feet should read each $7.75			
"	312	"	3234, 100 feet should read each $7.75			
"	333	"	3475 made of steel tubing, not hardwood			
"	358	"	3940 should read with gradienter screw each $180.00			
"	358	"	3941 should read with gradienter screw each $195.00			
"	373	"	4502 should read without stops to needle.			
"	389	"	5257 should read No. 5287			
"	397	"	5411 should read 16,000 feet.			

GENUINE SWISS INSTRUMENTS —Continued

Made of German silver and best English tempered steel

Illustrations two-thirds size

747 748 749 750 751 752 753

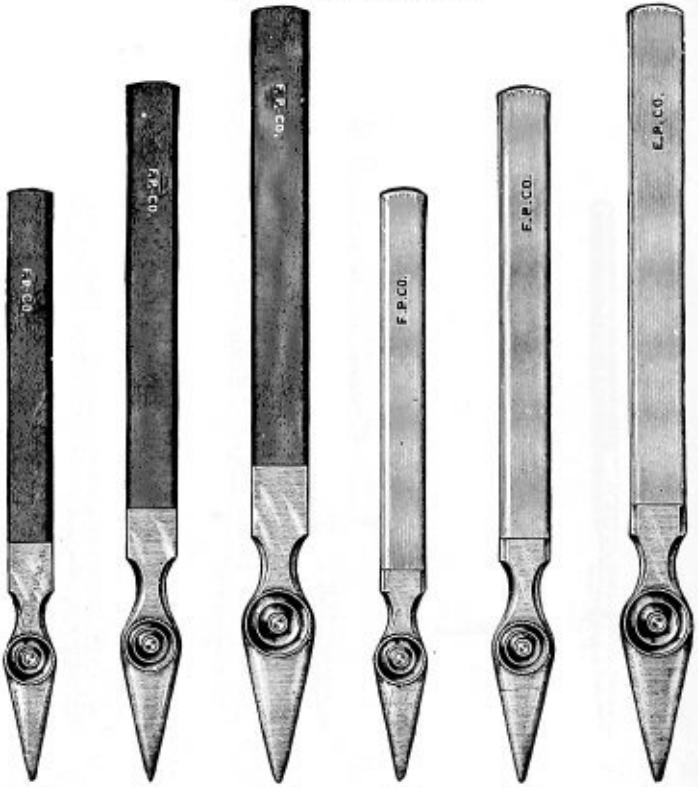
		Each
No. 747.	Ruling Pen, Ebony Handle, with release spring, 4½ inches	$1 80
748.	" " " " " " " 5 "	1 90
749.	" " " " " " " 5½ "	2 00
750.	Railroad Pen, Improved, Ivory Handle, 5 inches	4 25
751.	Border " " " " 6½ "	3 85
752.	Dotting " 6 inches, Ivory Handle, 6 wheels, with ink reservoir	4 50
753.	Improved Dotting Pen, in case	7 50

Pens carefully sharpened and polished for 25 cents each

GENUINE SWISS INSTRUMENTS —Continued

Made of German silver and best English tempered steel

Illustrations two-thirds size



755 756 757 758 759 760

SWEDISH STYLE RULING PENS

		Each
No. 755.	Ebony handle, upper blade with spring, 5 inches	$1 50
756.	" " " " " " 6 "	1 70
757.	" " " " " " 7 "	1 85
758.	Aluminum handle, upper blade with spring, 5 inches	1 80
759.	" " " " " " 6 "	2 15
760.	" " " " " " 7 "	2 50

Pens carefully sharpened and pointed for 25 cents each

GENUINE SWISS INSTRUMENTS —Continued

Made of German silver and best English tempered steel. Illustrations two-thirds size

763

764

765

		Each
No. 763.	Steel Spring Bow Dividers, 3½ inches, metal handle	$2 00
764.	" " " Pencil, 3½ " " "	2 75
765.	" " " Pen, 3½ " " "	2 75
766.	Set of Bows, Nos. 763, 764 and 765, in morocco case. Per set	8 20

767

768

769

		Each
No. 767.	Steel Spring Bow Dividers, 3½ inches, metal handle	$2 40
768.	" " " Pencil, 3½ " " "	3 00
769.	" " " Pen, 3½ " " "	3 00
770.	Set of Bows, Nos. 767, 768 and 769, in morocco case. Per set	9 60

All above Bow Pens and Bow Pencils have patent needle point adjusters.

GENUINE SWISS INSTRUMENTS —Continued

Made of German silver and best English tempered steel

Illustrations two-thirds size

773

774

777

778

		Each
No. 773.	Spring Bow Pen, self-adjusting, 4 inches	$3 75
774.	" " " with Pencil, self-adjusting	5 00
776.	No. 774 Spring Bow Pen, with Pencil, in morocco case, silk velvet lined	5 75

Nos. 773 and 774 are best for drawing small circles.

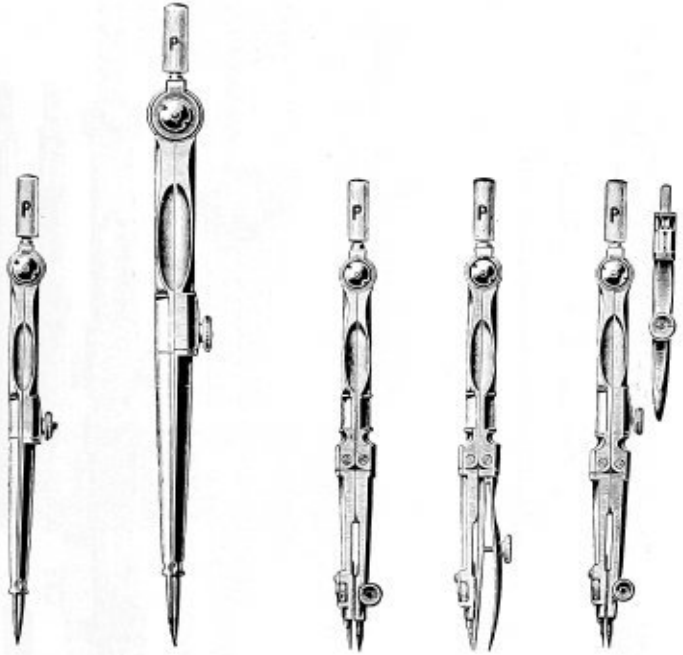
Scratching of pen and slipping of needle point is prevented by small center rod, which remains stationary while the attachment with pen or pencil point is turned, thus drawing circles by its own weight.

No. 777.	Plain Divider, 3½ inches, pivot joint and straightening device	$ 3 00
778.	" " 5 " " " " " "	3 25

GENUINE SWISS INSTRUMENTS —Continued

Made of German silver and best English tempered steel

Illustrations two-thirds size



779 780 781 782 783

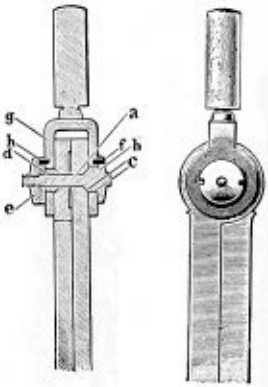
		Each
No. 779.	Hairspring Divider, 3½ inches, pivot joint and straightening device	$3 85
780.	" " 5 " " " " " "	4 10
781.	Compasses, 3½ inches, fixed patent adjustable needle and pencil point and straightening device, pivot joint	4 50
782.	Compasses, 3½ inches, fixed patent adjustable needle and pen point, straightening device, pivot joint	4 50
783.	Compasses, 3½ inches, fixed patent adjustable needle point, pen and pencil points, straightening device, pivot joint	6 00

GENUINE SWISS INSTRUMENTS —Continued

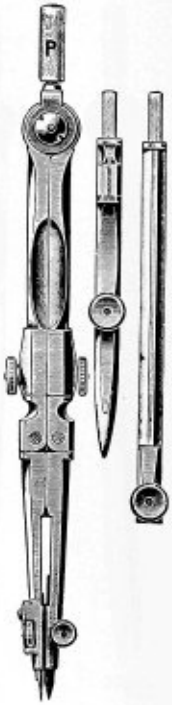
Made of German silver and best English tempered steel

Illustrations two-thirds size

784



Kern's Patent
Improved Pivot Joint



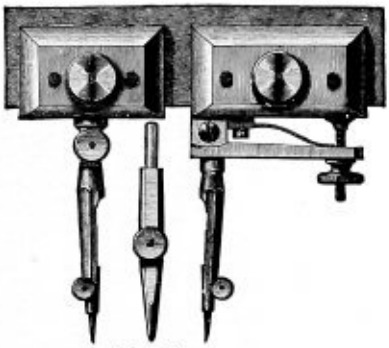
785

		Each
No. 784.	Compasses, 5½ inches, with fixed patent adjustable needle point, pencil, pen point and lengthening bar, straightening device and pivot joint	$8 00
785.	Compasses, 5½ inches, same as No. 784 but with hairspring	8 75

GENUINE SWISS INSTRUMENTS —Continued

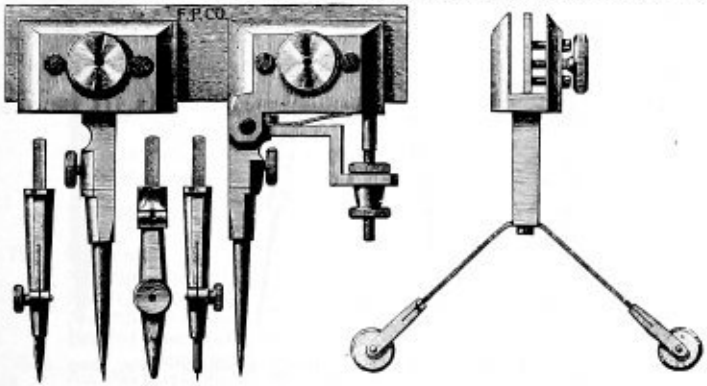
Made of German silver and best English tempered steel

Illustrations two-thirds size



No. 786

		Each
No. 786.	Beam Compasses, to fit on any straight edge, with two needle points, exchangeable for lead and pen point, and micrometer adjustment	$ 9 50
787.	Wheel attachment for No. 786	2 40
787A.	No. 786, in morocco case, silk velvet lined	11 00
787B.	Nos. 786 and 787, in morocco case, silk velvet lined	13 75



788 789

		Each
No. 788.	Beam Compasses, to fit any straight edge, with two steel points, pen, pencil and needle point and micrometer adjustment	$10 25
789.	Wheel Attachment for No. 788	2 40
789A.	No. 788, in morocco case, silk velvet lined	11 75
789B.	Nos. 788 and 789, in morocco case, silk velvet lined	14 50

For Beam Compass Bars, see page 225

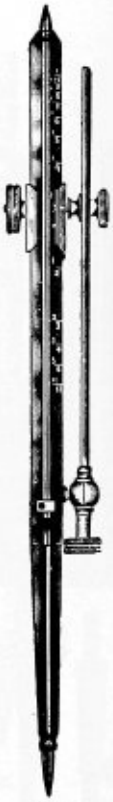
GENUINE SWISS INSTRUMENTS —Continued

Made of German silver and best English tempered steel

Illustrations two-thirds size

790

791



792

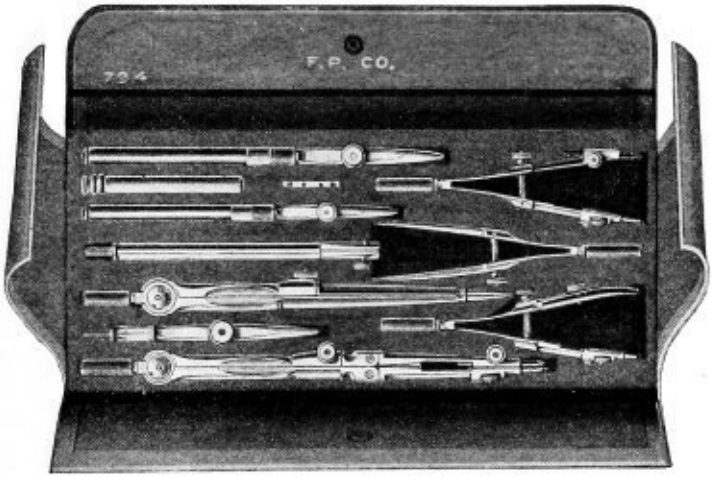
		Each
No. 790.	Proportional Dividers, 7½ inches, finely graduated for lines and circles	$10 00
791.	Proportional Dividers, 9½ inches, with rack movement, finely graduated for lines and circles	12 50
792.	Proportional Dividers, 9½ inches, with micrometer adjustment, finely graduated for lines, circles, planes and solids	16 50

	Nos. 790	791	792
Morocco cases, lined with silk velvet, for			
Each	$0 80	0 90	1 20

GENUINE SWISS INSTRUMENTS IN CASES

Made of German silver and best English tempered steel
In pocket-book style cases, silk velvet lined. Style A

For description, see page 71



No. 794

No. 793. Containing:—
No. 741 Ruling Pen, 5 inches, with spring and ebony handle.
No. 765 Steel Spring Bow Pen, 3½ inches, metal handle, adjustable needle point.
No. 778 Plain Dividers, 5 inches, pivot joint.
No. 784 Compasses, 5½ inches, with fixed needle point, pen, pencil point and lengthening bar, pivot joint.
Box with leads. Per set..... $18 00

No. 794. Containing:—
No. 740 Ruling Pen, 4½ inches, with spring and ebony handle.
No. 741 Ruling Pen, 5 inches, with spring and ebony handle.
No. 763 Steel Spring Bow Dividers, 3½ inches, metal handle.
No. 764 Steel Spring Bow Pencil, 3½ inches, metal handle, adjustable needle point.
No. 765 Steel Spring Bow Pen, 3½ inches, metal handle, adjustable needle point.
No. 780 Hairspring Dividers, 5 inches, pivot joint.
No. 784 Compasses, 5½ inches, with fixed needle point, pen, pencil point and lengthening bar, pivot joint.
Box with leads. Per set..... $25 00

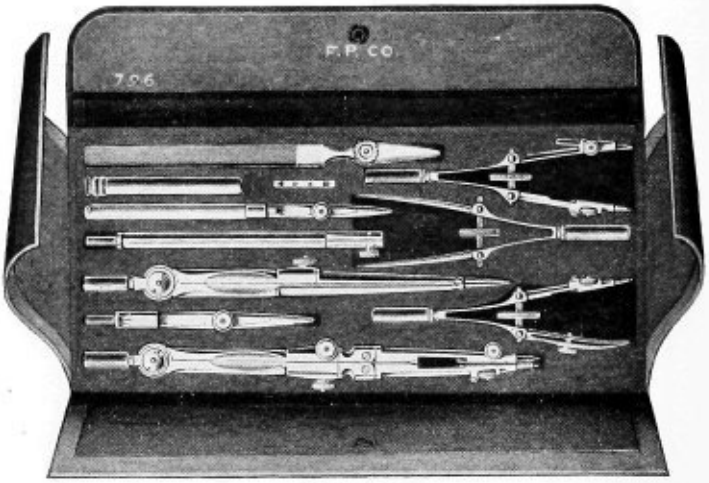
No. 795. Containing the same as No. 794, but with Hairspring Compasses, No. 785, instead of No. 784. Per set..... 25 75

GENUINE SWISS INSTRUMENTS —Continued

IN CASES

Made of German silver and best English tempered steel

In pocket-book style case Style A



No. 796

No. 796. Containing:—
No. 740 Ruling Pen, 4½ inches, with spring and ebony handle.
No. 756 Swedish Detail Pen, 6 inches.
No. 757 Steel Spring Bow Divider, 3½ inches, center screw.
No. 768 Steel Spring Bow Pencil, 3½ inches, center screw.
No. 769 Steel Spring Bow Pen, 3½ inches, center screw.
No. 780 Hairspring Divider, 5 inches, pivot joint.
No. 785 Compass, 5½ inches, Hairspring with fixed needle point, pen, pencil and lengthening bar, straightening device and pivot joint.
Box with leads.
Per set $27 50

SEPARATE PARTS FOR SWISS INSTRUMENTS

It is necessary to send us the Instruments to properly fit parts

Pen, Pencil or Needle Point for 3½-inch Compass	Each,	$1 25
" " " " " 5½- " "	"	1 60
Screws and Nuts	"	25
Shouldered Needles	"	15
Ebony and Ivory Handles for Ruling Pens	"	25
Aluminum " " " "	"	30
Box with leads	"	25

For separate parts of other instruments, see page 158

EXCELSIOR DRAWING INSTRUMENTS

Of best German silver, highly polished, with steel points

For description, see page 72

Illustrations two-thirds size

| | | |

EXCELSIOR DRAWING INSTRUMENTS —Continued

Of best German silver, highly polished, with steel points

Illustrations two-thirds size

808 809 810 812 813

SWEDISH RULING PENS

		Each
No. 808.	Ebony handle, upper blade with spring, 5 inches, for long lines	$0 90
809.	" " " " " " 6 " " " "	1 05
810.	" " " " " " 7 " " " "	1 20
808A.	Aluminum" " " " " 5 " " " "	1 40
809A.	" " " " " " 6 " " " "	1 55
810A.	" " " " " " 7 " " " "	1 70

DETAIL PENS

		Each
No. 812.	Ebony Handle, 6½ inches,	$1 00
813.	" " 6¼ " for double lines	2 00

These pens are made to hold a great deal of ink, and, not requiring frequent refilling, are best adapted for drawing long and heavy lines.

Pens carefully sharpened and polished for 25 cents each

EXCELSIOR DRAWING INSTRUMENTS —Continued

Of best German silver, highly polished, with steel points

Illustrations two-thirds size

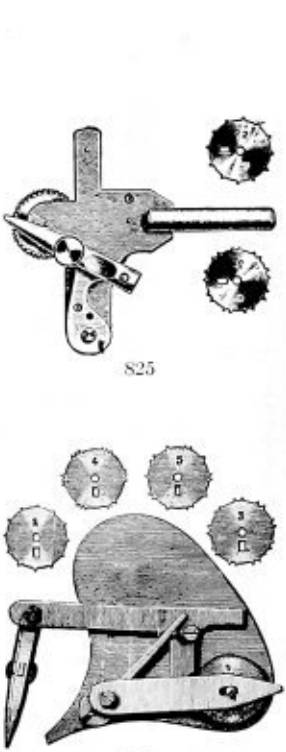
815 816 817 818 819

		Each
No. 815.	Hatching Pen, with pushing screw, 5 inches, with three pens to handle	$1 65
816.	Ruling Pen, wedge regulated at upper end of handle	1 50
817.	Curve Pen, 4¾ inches, blades fastened to a rod in a hollow handle, with screw at upper end to set firm or loose	1 50
818.	Railroad Pen, 5½ inches, for straight or curved lines, regulated by the screw at top of handle	4 00
819.	Railroad Pen, 5 inches, with center screw adjustment, pens have spring back, patent release lever for cleaning without changing the width of line	4 00

Pens carefully sharpened and polished for 25 cents each

EXCELSIOR DRAWING INSTRUMENTS —Continued

Of best German silver, highly polished, with steel points
Illustrations two-thirds size



825

820

821

822

823

826

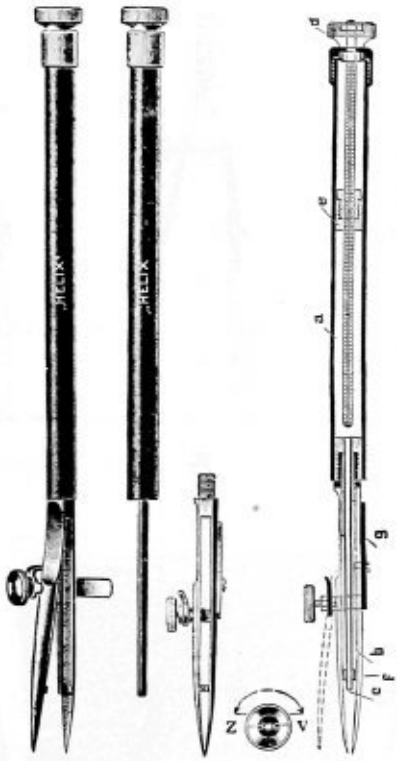
		Each
No. 820.	Dotting Instrument, with six wheels, in case	$4 50

By throwing back the spring the wheels of different patterns are inserted. The wheel is rolled on edge of a T square or straight edge and causes the pen to move up and down by means of a ratchet wheel.

No. 821.	Dotting Pen, 4¾ inches, with four wheels	5 00
822.	" " Ebony Handle, with one extra wheel	1 80
823.	Pricker, Ebony Handle	60
824.	" Bone "	1 00
825.	Dotting Instruments for curved lines, with three wheels in case, same will fit Beam Compass No. 1029	4 20
826.	Dotting Pen, with milled metal handle, pen part will fit Compasses Nos. 621 or 622, for drawing dotted circles, with three wheels, in case	3 00

EXCELSIOR DRAWING INSTRUMENTS —Continued

Of best German silver, highly polished, with steel points
Illustrations two-thirds size



No. 827. Helix Fountain Ruling Pen, 5½ inches long..... Each, $2 00

The Helix Fountain Ruling Pen is an improvement over all other fountain ruling pens that are used with drawing ink. The pen has a spring back and is constructed just like other ruling pens, with a release lever to open the pen for cleaning. By turning the thumb screw at end of handle to the right the proper amount of ink can be fed into the pen. If there should be too much ink in the pen, by reversing the thumb screw to the left the extra amount of ink will then be drawn into the handle or reservoir.

To fill the reservoir, unscrew the pen part from handle and insert the feeding tube in the bottle of ink, turn the thumb screw to the left until it stops, then screw pen on handle and the pen is ready for use.

EXCELSIOR DRAWING INSTRUMENTS —Continued

Of best German silver, highly polished, with steel points

Illustrations two-thirds size

860

861

862

		Each
No. 860.	Minute Steel Spring Bow Divider, 2½ inches, metal handle	$1 00
861.	" " " " Pencil, 2½ " " "	1 25
862.	" " " " Pen, 2½ " " "	1 25
863.	Set of Bows, Nos. 860, 861 and 862, in morocco case, silk velvet lined	4 50

870

871

872

		Each
No. 870.	Steel Spring Bow Divider, 3½ inches, metal handle	$1 10
871.	" " " Pencil, 3½ " " "	1 35
872.	" " " Pen, 3½ " " "	1 35
873.	Set of Bows, Nos. 870, 871 and 872, in morocco case, silk velvet lined	4 60

EXCELSIOR DRAWING INSTRUMENTS —Continued

Of best German silver, highly polished, with steel points

Illustrations two-thirds size

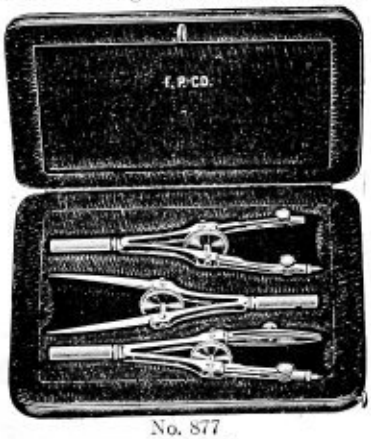
874

875

876

			Each
No. 874.	Steel Spring Bow Divider, 3½ inches, center screw, metal handle		$1 65
875.	" " " Pencil, 3½ " " " " "		1 90
876.	" " " Pen, 3½ " " " " "		1 90

These bows have a screw on a right and left thread, which bolts the points firmly in any position.



No. 877

No. 877. Set of Bows, Nos. 874, 875 and 876, in morocco case, silk velvet lined, Per set $6 50

EXCELSIOR DRAWING INSTRUMENTS —Continued

Made of best German silver, highly polished, with steel points
Illustrations two-thirds size

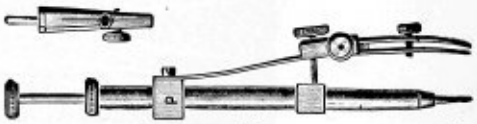
882

883

884

		Each
No. 882.	Steel Spring Bow Divider, 4½ inches, metal handle	$1 65
883.	" " " Pencil, 4½ " " "	2 10
884.	" " " Pen, 4½ " " "	2 10
885.	Set of Bows, Nos. 882, 883 and 884, in morocco, silk velvet lined case. Per set	6 90

887



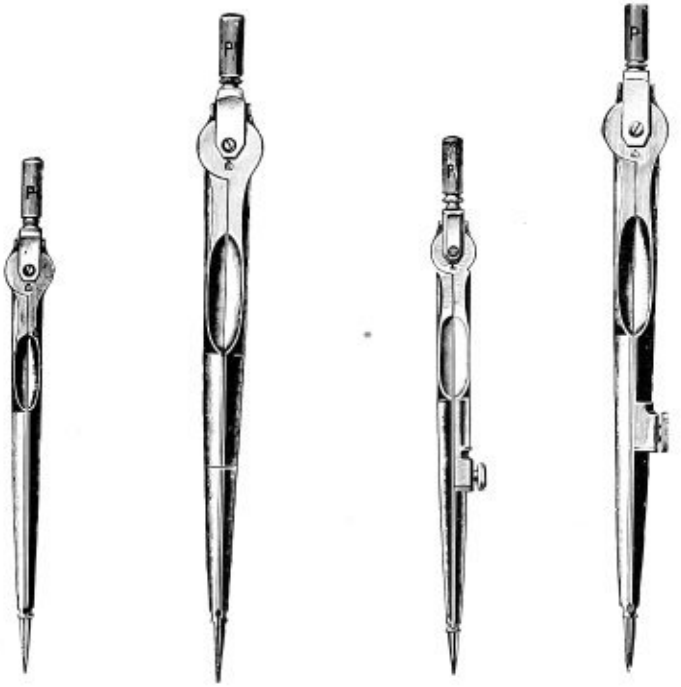
888

		Each
No. 887.	Spring Bow Pen, self-adjusting	$1 80
888.	" " " " with pencil point	3 00
889.	No. 888 Spring Bow Pen in case	3 75

EXCELSIOR DRAWING INSTRUMENTS —Continued

Of best German silver, highly polished, with steel points

Illustrations two-thirds size



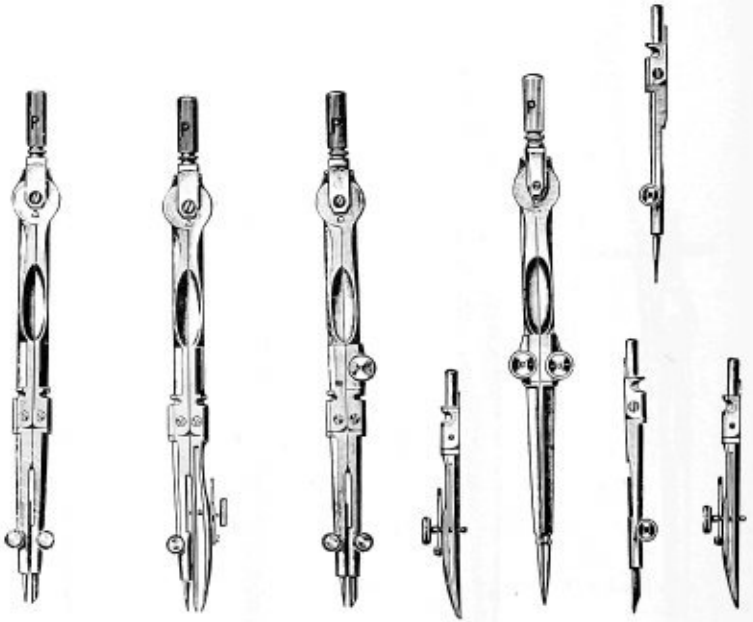
892 893 894 896

		Each
No. 892.	Plain Divider, 4½ inches, pivot joint, straightening device	$1 35
893.	" " 6 " " " " " "	1 50
894.	Hairspring Divider, 4½ inches, pivot joint, straightening device	1 90
896.	" " 6 " " " " " "	2 40

EXCELSIOR DRAWING INSTRUMENTS —Continued

Of best German silver, highly polished, with steel points

Illustrations two-thirds size



904 905 906 908

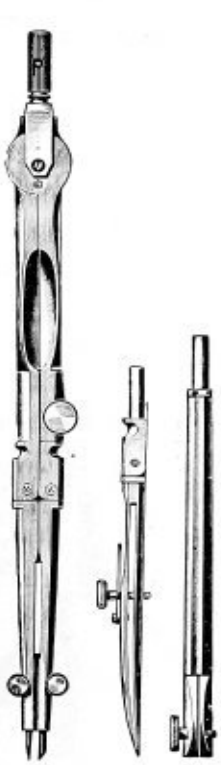
		Each
No. 904.	Compasses, 4¼ inches, fixed needle and pencil point, pivot joint and straightening device	$2 75
905.	Compasses, 4¼ inches, fixed needle and pen point, pivot joint and straightening device	2 75
906.	Compasses, 4¼ inches, needle and pencil and pen points, pivot joint and straightening device	3 60
908.	Compasses, 4¼ inches, with two steel points, pen, pencil and needle points, pivot joint and straightening device	4 20

All pen parts have patent release lever to open pen for cleaning without changing the width of line.

EXCELSIOR DRAWING INSTRUMENTS —Continued

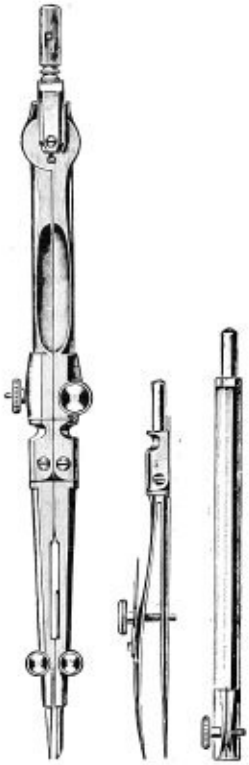
Of best German silver, highly polished, with steel points

Illustrations two-thirds size



911

Full size section of pivot joint



912

		Each
No. 911.	Compasses, 6 inches, fixed needle, pen and pencil points, and lengthening bar, pivot joint with straightening device	$4 20
912.	Compasses, 6 inches, hairspring, fixed needle point, pencil, pen points and lengthening bar, pivot joint, straightening device	5 00

All pen parts have patent release lever to open pen for cleaning without changing the width of line.

EXCELSIOR DRAWING INSTRUMENTS —Continued

Of German silver, highly polished, with steel points

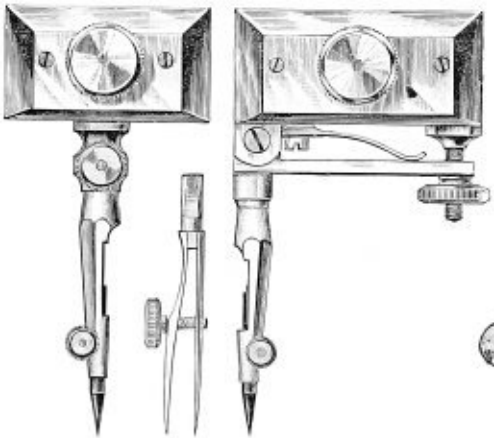
Illustrations two-thirds size

No. 916

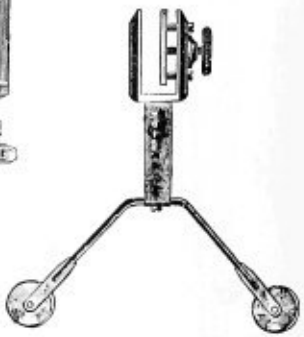
Each

No. 916. Miniature Beam Compasses, with two steel points, pen, pencil and needle point and micrometer adjustment $7 25

916A. Miniature Beam Compasses, No. 916, in morocco silk velvet lined case .. 8 00



918



919

Each

No. 918. Beam Compasses to fit on any straight edge with two needle points; interchangeable for lead, pen point and micrometer adjustment $8 25

918A. Beam Compasses, No. 918, in silk velvet lined case 9 50

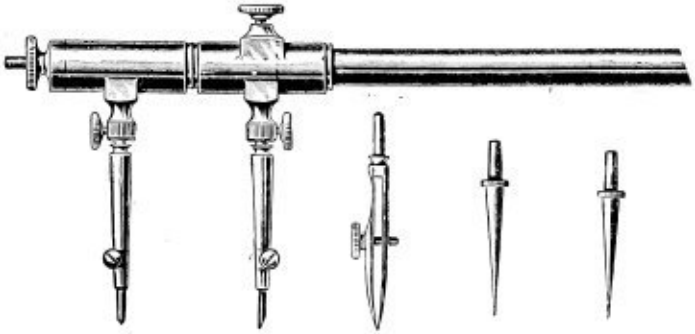
919. Wheel Attachment for No. 918 ..... 2 25

919A. Beam Compass No. 918, and wheel attachment No. 919, in silk velvet lined case 12 25

Bars for Beam Compasses, see page No. 225

EXCELSIOR DRAWING INSTRUMENTS —Continued

Of best German silver, highly polished, with steel points



No. 920

		Each
No. 920.	Tubular Beam Compasses, 18 inches, 2 round German silver bars, with two steel points, pen, pencil and needle point	$10 50
921.	Tubular Beam Compasses, 24 inches, 3 bars	11 75
922.	" " " 36 " 3 "	15 25
920A.	" " " No. 920, in morocco case	12 50
921A.	" " " No. 921, " "	14 00
922A.	" " " No. 922, " "	18 50

923

924

		Each
No. 923.	Wheel Attachment for Nos. 920-921	$2 50
923A.	" " " 922	2 75
924.	Dotting pen to fit Nos. 920, 921 and 922, with two extra wheels	2 00
920C.	Tubular Beam Compasses, No. 920, with wheel attachment No. 923 and dotting pen part No. 924, in case	15 00
921C.	Tubular Beam Compasses, No. 921, with wheel attachment No. 923 and dotting pen part No. 924, in case	17 00
922C.	Tubular Beam Compasses, No. 922, with wheel attachment No. 923A and dotting pen part No. 924, in case	21 75

EXCELSIOR DRAWING INSTRUMENTS —Continued

Of best German silver, highly polished, with steel points

Illustrations two-thirds size

925

927

928

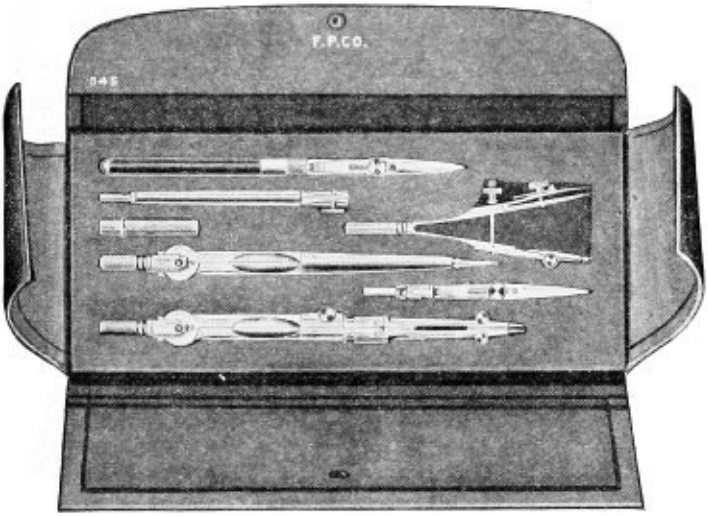
		Each
No. 925.	Proportional Dividers, 7¼ inches, for lines and circles, in case	$ 7 00
926.	" " 9¼ " " " " "	10 00
927.	" " 7¼ " with rack movement, for lines, circles, planes and solids, in case	11 00
928.	Proportional Dividers, 9¼ inches, with micrometer adjustment, for lines and circles, in case	14 00

EXCELSIOR DRAWING INSTRUMENTS —Continued

Made of best German silver, highly polished, with steel points

In pocket-book style cases, green silk velvet lined

For description, see page 72



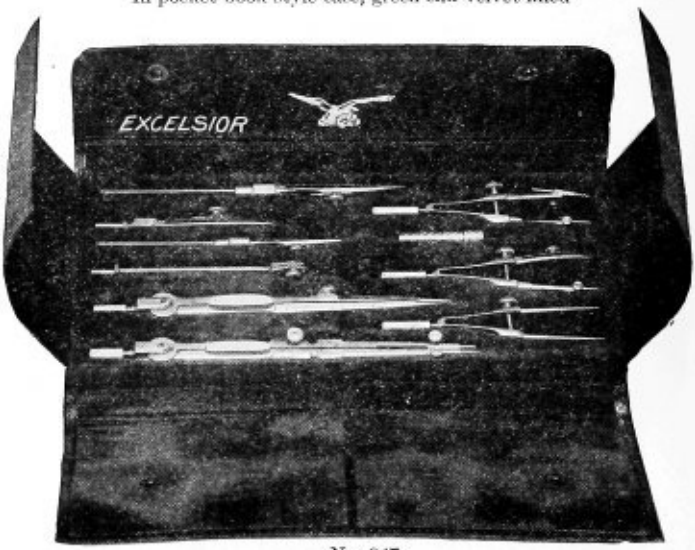
No. 945

No. 945. Containing:—
No. 801 Ruling Pen, 5 inches, with spring and ebony handle, release lever.
No. 872 Steel Spring Bow Pen, 3½ inches, metal handle.
No. 893. Plain Divider, 6 inches, pivot joint and straightening device.
No. 911 Compasses, 6 inches, with fixed needle, pen and pencil point, lengthening bar and straightening device.
Key and box with lead.
Per set.....$9 00

No. 946. Containing:—
No. 802 Ruling Pen, 5½ inches, with spring and ebony handle, release lever.
No. 871 Steel Spring Bow Pencil, 3½ inches, metal handle.
No. 872 " " " Pen, 3½ " " "
No. 896 Hairspring Divider, 6 inches, pivot joint, straightening device.
No. 911 Compasses, 6 inches, with fixed needle, pen and pencil point, lengthening bar and straightening device.
Key and box of leads.
Per set.....$11 70

EXCELSIOR DRAWING INSTRUMENTS —Continued

Of best German silver, highly polished, with steel points
In pocket-book style case, green silk velvet lined



No. 947

No. 947. Containing:—
No. 800 Ruling Pen, 4½ inches, with spring and ebony handle, release lever.
No. 802 Ruling Pen, 5½ inches, with spring and ebony handle, release lever.
No. 870 Steel Spring Bow Divider, 3½ inches, metal handle.
No. 871 " " " Pencil, 3½ " " "
No. 872 " " " Pen, 3½ " " "
No. 896 Hairspring Divider, 6 inches, pivot joint and straightening device.
No. 911 Compasses, 6 inches, with fixed needle point, pencil and pen point, lengthening bar, pivot joint and straightening device, key and box of leads. Per set..... $13 75

No. 947B. Contains same as No. 947, but with Hairspring Compass No. 912 in place of No. 911.
Per set..... 14 55

No. 947C. Contains same as No. 947 but with center screw Bows Nos. 874, 875 and 876 in place of bows Nos. 870, 871 and 872.
Per set..... 15 00

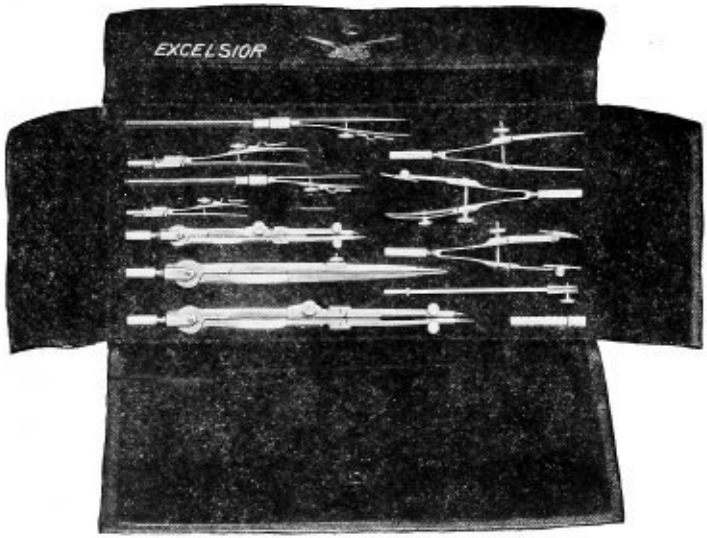
No. 947E. Contains same as No. 947C but with No. 809 Swedish Detail Pen, 6 inches, in place of Ruling Pen No. 802.
Per set..... 15 25

Any other assortments in morocco cases fitted up to order at short notice

EXCELSIOR DRAWING INSTRUMENTS —Continued

Of best German silver, highly polished, with steel points

In pocket-book style cases, green silk velvet lined



No. 948

No. 948. Containing:—

No. 800 Ruling Pen, 4½ inches, with spring and ebony handle, release lever.

No. 802 Ruling Pen, 5½ inches, with spring and ebony handle, release lever.

No. 870 Steel Spring Bow Divider, 3½ inches, metal handle.

No. 871 " " " Pencil, 3½ " " "

No. 872 " " " Pen, 3½ " " "

No. 896 Hairspring Divider, 6 inches, pivot joint and straightening device.

No. 906 Compasses, 4½ inches, with fixed needle point, pen and pencil points, pivot joint and straightening device.

No. 911 Compasses, 6 inches, with pencil, pen, needle points, lengthening bar, pivot joint and straightening device.

Box with leads.

Per set $17 20

No. 950. Containing the same as No. 948, but with No. 912 compasses in place of No. 911.

Per set $18 00

See Empty Morocco Cases on page 157

UNIVERSITY DRAWING INSTRUMENTS

German silver and steel points

For description, see page 72

Illustrations two-thirds size

1000 1001 1002 1004 1005 1006

		Each
No. 1000.	Ruling Pen, Ebony Handle, upper blade with spring, 4½ inches	$0 55
1001.	" " " " " " " " 5 "	60
1002.	" " " " " " " " 5½ "	65
1004.	" " 4½ inches, Aluminum Handle, with fine joint and pin	65
1005.	" " 5 " " " " " " " "	70
1006.	" " 5½ " " " " " " " "	75

Aluminum handles furnished for Nos. 1000, 1001, and 1002 at 10 cents additional

Pens carefully sharpened and polished for 25 cents each

UNIVERSITY DRAWING INSTRUMENTS —Continued

German silver and steel points

1008

1009

1010

Illustrations two-thirds size

		Each
No. 1008.	Steel Spring Bow Dividers, 3½ inches, metal handle	$0 80
1009.	" " " Pencil, 3½ " " "	1 10
1010.	" " " Pen, 3½ " " "	1 10
1011.	Set of Bows Nos. 1008, 1009 and 1010, in case	Per set, 3 80

1008A

1009A

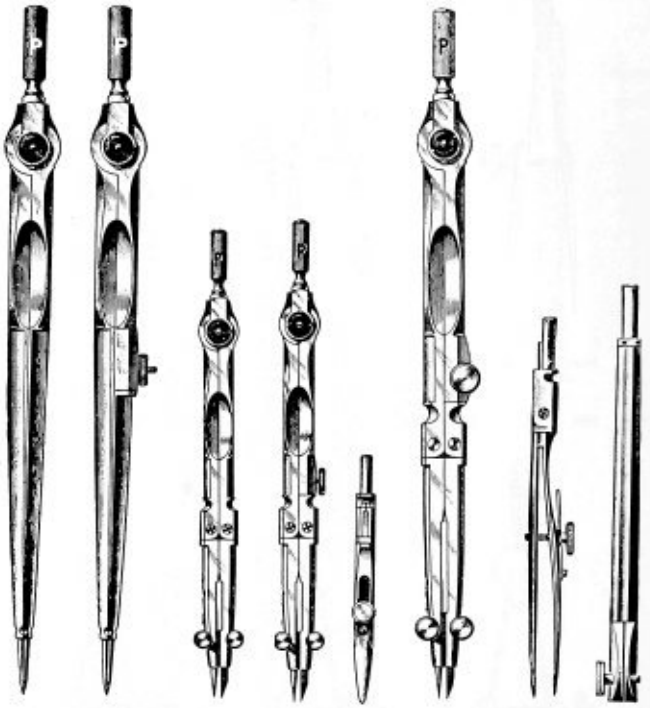
1010A

		Each
No. 1008A.	Bow Dividers, 3½ inches, circular spring, metal handle	$1 00
1009A.	" Pencil, 3½ " " " " "	1 25
1010A.	" Pen, 3½ " " " " "	1 25
1011A.	Set of Bows Nos. 1008A, 1009A and 1010A, in case	Per set, 4 30

UNIVERSITY DRAWING INSTRUMENTS —Continued

German silver and steel points

Illustrations two-thirds size



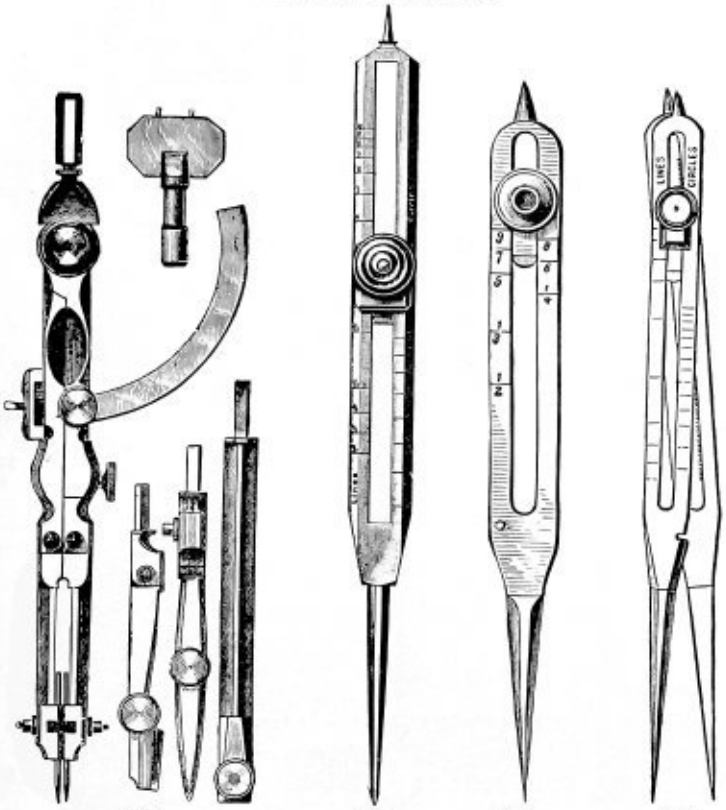
1012 1013 1014 1017 1020

		Each
No. 1012.	Plain Divider, 5½ inches, with straightening device	$1 25
1013.	Hairspring " 5½ " " " "	2 00
1014.	Compasses, 4¼ inches, with fixed needle and pencil point, straightening device	2 20
1016.	Compasses, 4¼ inches, with fixed needle and pen point, straightening device	2 20
1017.	Compasses, 4¼ inches, with fixed needle, pen and pencil point, straightening device	2 70
1020.	Compasses, 5½ inches, with fixed needle, pen and pencil point, lengthening bar and straightening device	3 20

UNIVERSITY DRAWING INSTRUMENTS —Continued

German silver and steel points

Illustrations two-thirds size

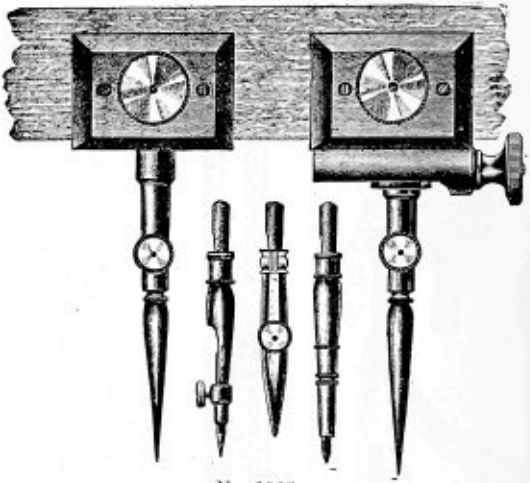


1022 1023 1024 1025

		Each
No. 1022.	Lithographic Compasses, with arc, set-screw and micrometer adjustment, 8 inches, with pencil and pen point, lengthening bar and key, in case	$13 80
1023.	Proportional Divider, 7¼ inches, for lines and circles, in case	6 90
1024.	" Dividers, Brass, 6¼ inches, for lines and circles, in case	2 75
1025.	Proportional Dividers, Brass, 7 inches, with rack movement for lines and circles	6 00

UNIVERSITY DRAWING INSTRUMENTS —Continued

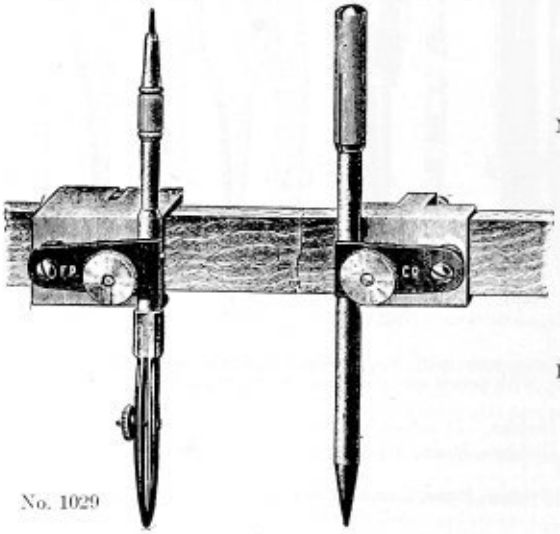
German silver, with steel points



Illustrations two-thirds size

No. 1026

		Each
No. 1026.	Beam Compass with micrometer adjustment, two steel points, pen, pencil and needle point	$7 50
1027.	Same as No. 1026, in case	8 25



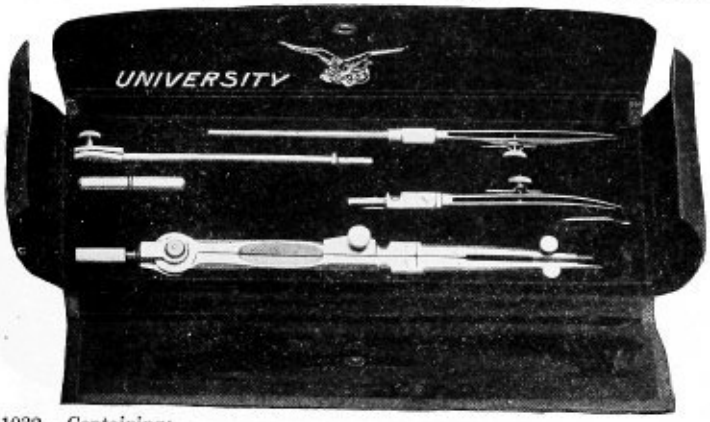
No. 1029

No. 1029. Beam Compass, pen, pencil and needle points Each...$6 75

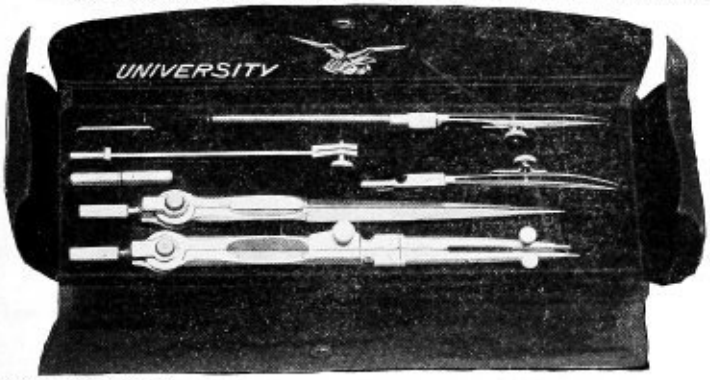
For Beam Compass Bars, see page 225

UNIVERSITY DRAWING INSTRUMENTS —Continued

German silver and steel points. In pocket-book style, green cotton velvet lined cases



No. 1032. Containing:—
No. 1002 Ruling Pen, 5½ inches, ebony handle, with spring and release lever.
No. 1020 Compass, 5½ inches, fixed needle point, pen, pencil points, lengthening bar and straightening device.
Key and box of leads. Per set.....$4 50

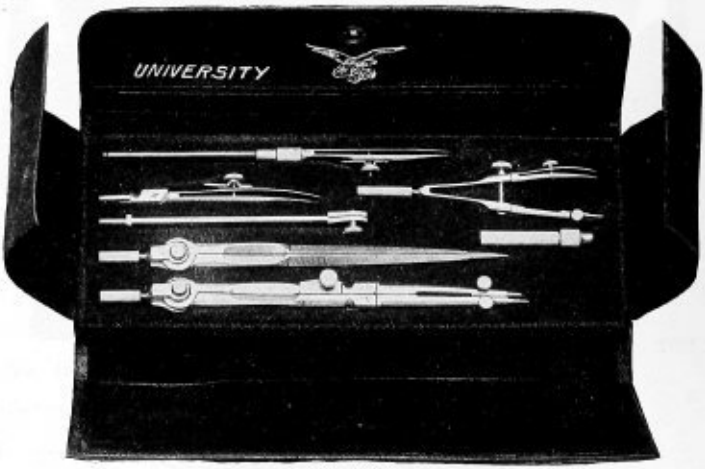


No. 1034. Containing:—
No. 1002 Ruling Pen, 5½ inches, ebony handle, with spring and release lever.
No. 1012 Plain Divider, 5 inches, with straightening device.
No. 1020 Compass, 5½ inches, fixed needle point, pen, pencil points, lengthening bar and straightening device.
Key and box of leads. Per set.....$5 75

UNIVERSITY DRAWING INSTRUMENTS —Continued

German silver and steel points

In pocket book style, green cotton velvet lined cases



No. 1040

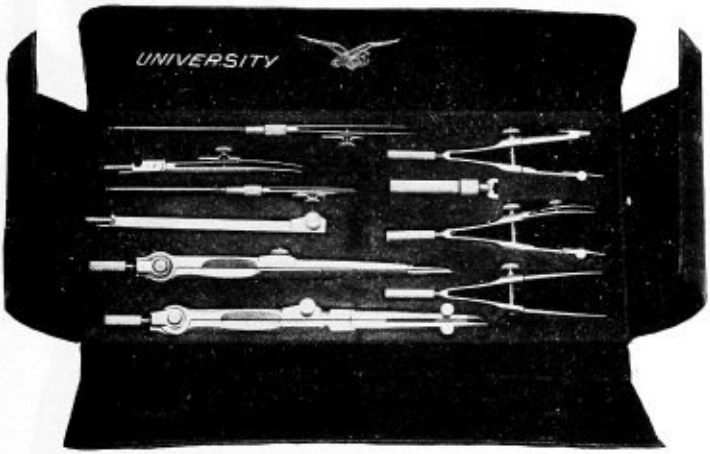
No. 1040. Containing:—
No. 1002 Ruling Pen, 5½ inches, ebony handle, with spring and release.
No. 1010 Steel Spring Bow Pen, 3½ inches, metal handle.
No. 1012 Plain Divider, 5 inches, with straightening device.
No. 1020 Compass, 5½ inches, fixed needle point, pen, pencil point lengthening bar and straightening device.
Key and box of leads.
Per set.....$7 00

No. 1050. Containing:—
No. 1002 Ruling Pen, 5½ inches, ebony handle, with spring and release.
No. 1009 Steel Spring Bow Pencil, 3½ inches, metal handle.
No. 1010 Steel Spring Bow Pen, 3½ inches, metal handle.
No. 1013 Hairspring Divider, 5 inches, with straightening device.
No. 1020 Compass, 5½ inches, with fixed needle point, pen and pencil points, lengthening bar and straightening device.
Key and box of leads.
Per set.....$9 00

UNIVERSITY DRAWING INSTRUMENTS —Continued

German silver and steel points

In pocket-book style green cotton velvet lined cases



No. 1055

No. 1055. Containing:—

No. 1000 Ruling Pen, 4½ inches, ebony handle, with spring and release.

No. 1002 Ruling Pen, 5½ inches, ebony handle, with spring and release.

No. 1008 Steel Spring Bow Divider, 3½ inches, metal handle.

No. 1009 Steel Spring Bow Pencil, 3½ inches, metal handle.

No. 1010 Steel Spring Bow Pen, 3½ inches.

No. 1013 Hairspring Divider, 5 inches, with straightening device.

No. 1020 Compass, 5½ inches, with fixed needle point, pen and pencil points, lengthening bar and straightening device.

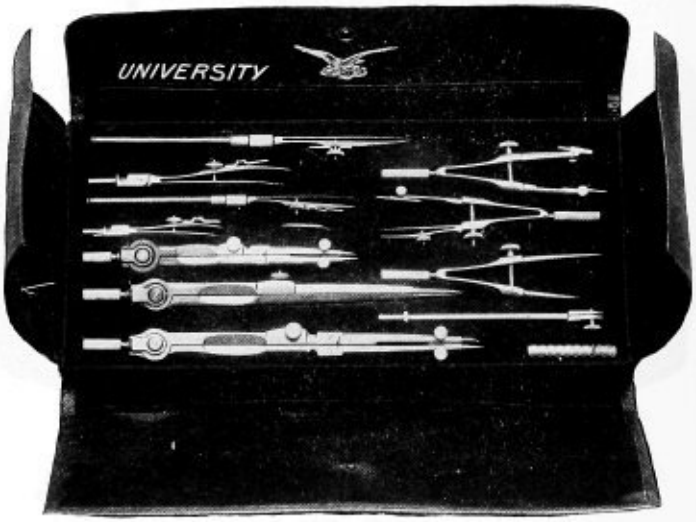
Key and box of leads.

In pocket-book case.....Per set, $10 40

UNIVERSITY DRAWING INSTRUMENTS —Continued

German silver and steel points

In pocket-book style, green cotton velvet lined cases



No. 1057

No. 1057. Containing:—

No. 1000 Ruling Pen, 4½ inches, ebony handle, with spring and release lever.

No. 1002 Ruling Pen, 5½ inches, ebony handle, with spring and release lever.

No. 1008 Steel Spring Bow Divider, 3½ inches, metal handle.

No. 1009 " " " Pencil, 3½ " " "

No. 1010 " " " Pen, 3½ " " "

No. 1013 Hairspring Divider, 5 inches, with straightening device.

No. 1017 Compass, 4¼ inches, fixed needle point, pen, pencil points and straightening device.

No. 1020 Compass, 5½ inches, with fixed needle point, pen and pencil points, lengthening bar and straightening device.

Key and box of leads in pocket-book style case.

Per set.....$13 75

COLLEGE DRAWING INSTRUMENTS

German silver and steel points

For description, see page 73

Illustrations two-thirds size

1060 1060A 1060B 1061 1061A 1061B

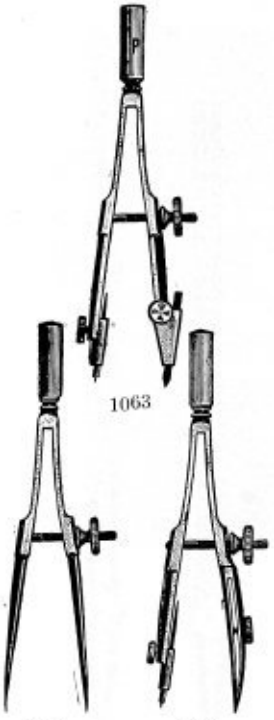
		Each
No. 1040.	Ruling Pen, 4½ inches, spring back, ebony handle	$0 50
1060A.	" " 5 " " " " " "	55
1060B.	" " 5½ " " " " " "	60
1061.	" " 4½ " with joint and ebony handle	60
1061A.	" " 5 " " " " " " "	65
1061B.	" " 5½ " " " " " " "	70

Pens carefully sharpened and polished for 25 cents each

COLLEGE DRAWING INSTRUMENTS —Continued

German silver and steel points

Illustrations two-thirds size



1063

1062 1064 1065 1066 1067

		Each
No. 1062.	Steel Spring Bow Divider, 3½ inches, metal handle	$0 75
1062A.	" " " " 3½ " circular spring	75
1063.	" " " Pencil, 3½ " metal handle	95
1063A.	" " " " 3½ " circular spring	95
1064.	" " " Pen, 3½ " metal handle	95
1064A.	" " " " 3½ " circular spring	95
1065.	Plain Divider, 5 inches, with straightening device	60
1066.	Hairspring Divider, 5 inches, with straightening device	1 35
1067.	Compass, 5½ inches, with fixed needle point, pen and pencil point, lengthening bar and straightening device	1 90

COLLEGE DRAWING INSTRUMENTS —Continued

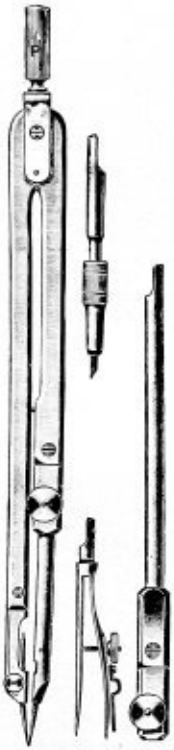
Flat System

German silver and steel points

Illustrations two-third size

1068

1068H



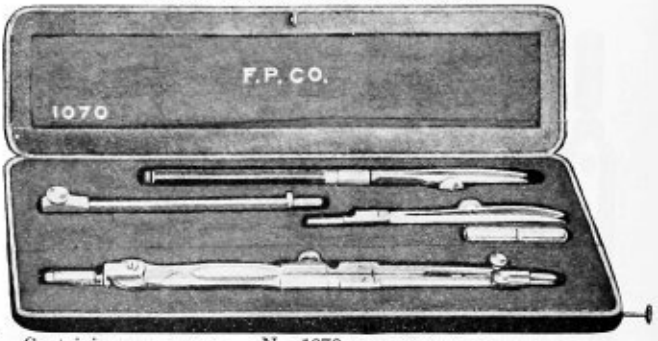
1069

		Each
No. 1068.	Plain Divider, 6 inches, with straightening device	$0 80
1068H.	Hairspring Dividers, 6 inches, with straightening device	1 50
1069.	Compass, 6 inches, with needle, pen, pencil points, lengthening bar and straightening device	2 25

Above instruments are listed in sets Nos. 1081 to 1085, on pages 143, 144 and 145

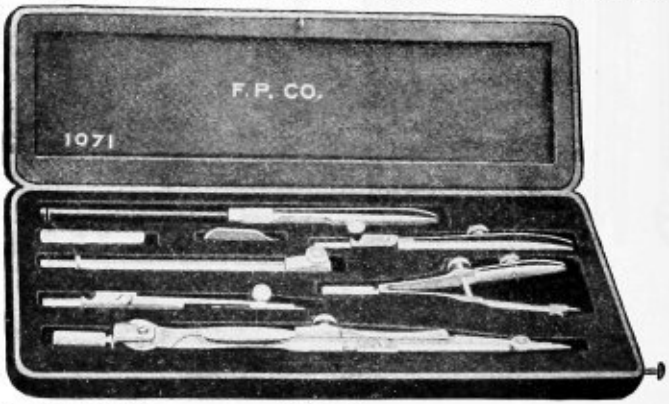
COLLEGE DRAWING INSTRUMENTS —Continued

Of German silver and steel points
In morocco pocket cases, lined with cotton velvet
For description of quality, see page 73



No. 1070. Containing:— No. 1070
No. 1060B Ruling Pen, 5½ inches, ebony handle.
No. 1067 Compass, 5½ inches, fixed needle point, pen and pencil point, lengthening bar and straightening device.
Key and box of leads. Per set.....$2 75

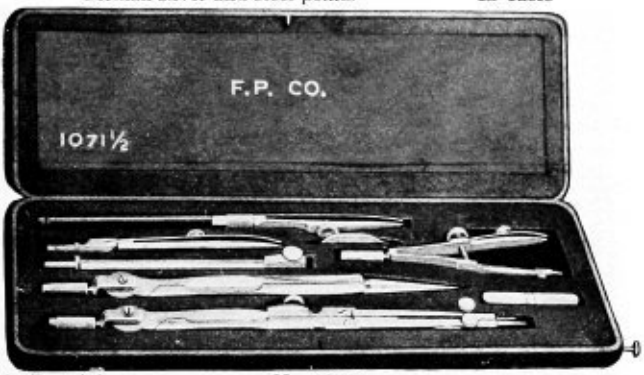
No. 1070¼. Contains same as No. 1070, with addition of plain divider No. 1065.
Per set..... 3 35



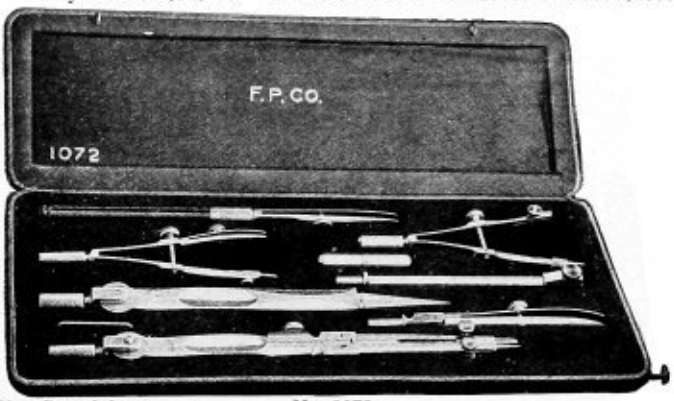
No. 1071. Containing:— No. 1071
No. 1060B Ruling Pen, 5½ inches, ebony handle.
No. 1064 Steel Spring Bow Pen, 3½ inches, metal handle.
No. 1067 Compass, 5½ inches, fixed needle point, pen, pencil points, lengthening bar and straightening device.
Key and box of leads. Per set.....$4 00

COLLEGE DRAWING INSTRUMENTS —Continued

German silver and steel points In Cases



No. 1071½. Containing:— No. 1071½
No. 1060B Ruling Pen, 5½ inches, ebony handle.
No. 1065 Plain Divider, 5½ inches, straightening device.
No. 1064 Steel Spring Bow Pen, 3½ inches, metal handle.
No. 1067 Compass, 5½ inches, fixed needle point, pen, pencil point, lengthening bar and straightening device.
Key and box of leads. Per set.....$4 70

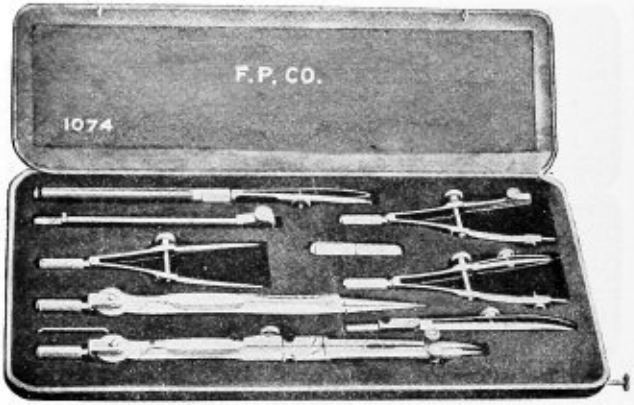


No. 1072. Containing:— No. 1072
No. 1060B Ruling Pen, 5½ inches, ebony handle.
No. 1063 Steel Spring Bow Pencil, 3½ inches, metal handle.
No. 1064 " " " Pen, 3½ " " "
No. 1065 Plain Divider, 5½ inches, with straightening device.
No. 1067 Compass, 5½ inches, fixed needle point, pen and pencil points, lengthening bar and straightening device.
Key and box of leads. Per set.....$5 25

No. 1073. Contains same as No. 1072, but in pocket-book case.....Per set, 5 60

COLLEGE DRAWING INSTRUMENTS —Continued

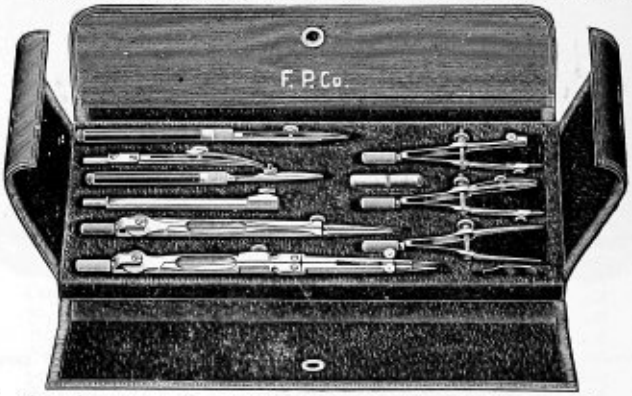
German silver and steel points — In Cases



No. 1074

No. 1074. Containing:—
No. 1060B Ruling Pen, 5½ inches, ebony handle.
No. 1062 Steel Spring Bow Divider, 3½ inches, metal handle.
No. 1063 " " " Pencil, 3½ " " "
No. 1064 " " " Pen, 3½ " " "
No. 1065 Plain Divider, 5½ inches, with straightening device.
No. 1067 Compass, 5½ inches, with fixed needle point, pen and pencil points, lengthening bar and straightening device.
Key and box of leads. Per set..... $5 90

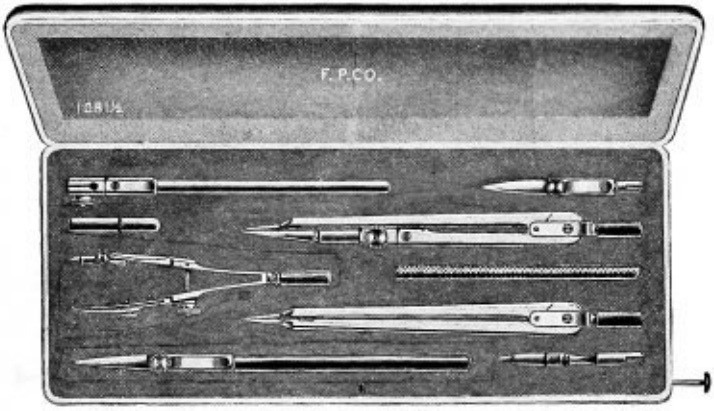
No. 1074H. Contains same as No. 1074, with addition of small ruling pen No. 1060 and hairspring divider No. 1066 in place of plain divider No. 1065. In bar lock case. Per set..... 7 00



No. 1075. Contains same as No. 1074H, but in pocket-book style case. Per set..$7 50

COLLEGE DRAWING INSTRUMENTS —Continued

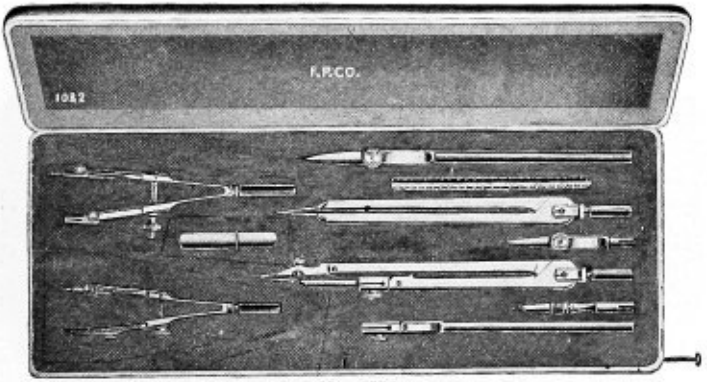
Flat System German silver and steel points In Cases



No. 1081½

No. 1081. Containing:—
No. 1060A Ruling Pen, 5 inches, spring back with release.
No. 1064A Bow Pen, 3½ inches, metal handle.
No. 1069 Compass with fixed needle point, pen and pencil points and lengthening bar. Key and box of leads. Per set....$4 75

No. 1081½. Contains same as No. 1081, with additional plain divider No. 1068.... 5 50

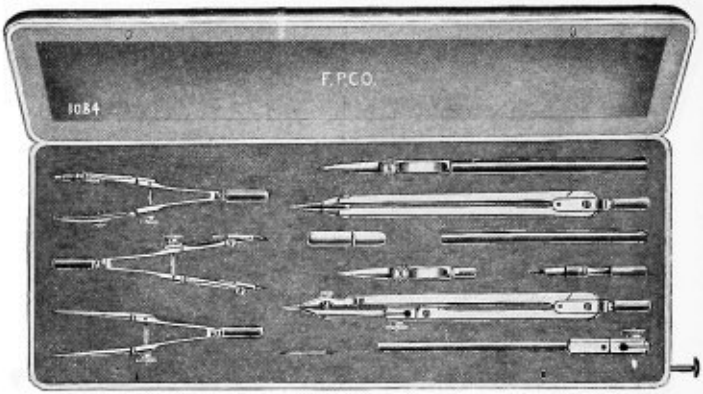


No. 1082

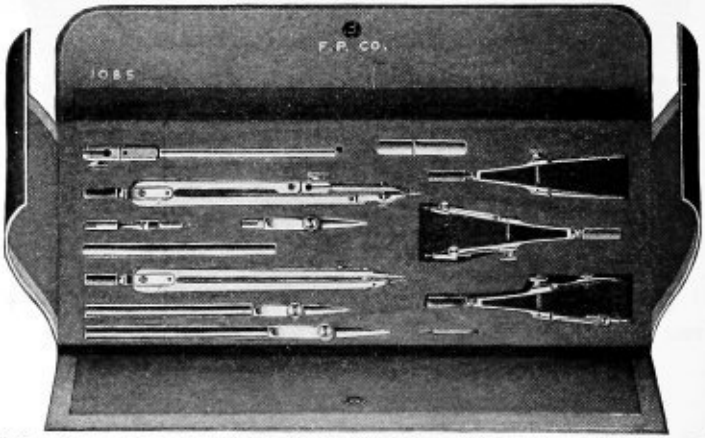
No. 1082. Containing:—
No. 1060A Ruling Pen, 5 inches, spring back with release.
No. 1063A Steel Spring Bow Pencil, 3½ inches, metal handle.
No. 1064A " " " Pen, 3½ " " "
No. 1068 Plain Divider.
No. 1069 Compass with fixed needle point, pen and pencil points and lengthening bar. Key and box of leads. Per set...$6 70

COLLEGE DRAWING INSTRUMENTS —Continued

Flat System German silver and steel points **In Cases**

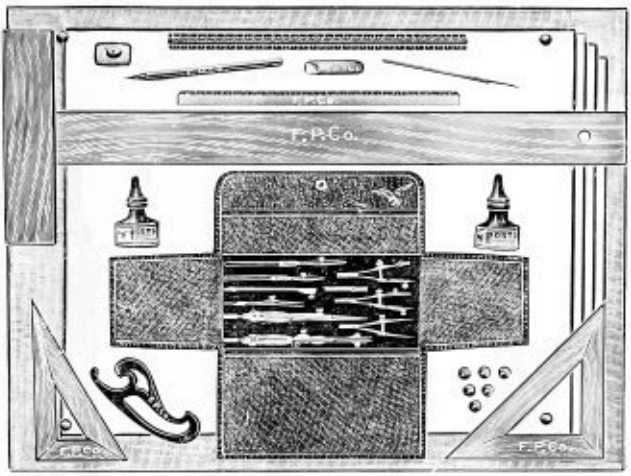


No. 1084. Containing:—
No. 1060B Ruling Pen, 5½ inches, in spring back, ebony handle with release.
No. 1062A Steel Spring Bow Divider, 3½ inches, metal handle.
No. 1063A " " " Pencil, 3½ " " "
No. 1064A " " " Pen, 3½ " " "
No. 1068 Plain divider, 6 inches, with straightening device.
No. 1069 Compass with needle, pen, pencil points, lengthening bar and straightening device, key and box of leads, in barlock case. Per set, $7 25



No. 1085. Same as No. 1084, but in Pocket-Book Case. Per set..... $8 80

COMPLETE DRAWING OUTFIT



No. 1092

No. 1090. Consists of the following:—
1 set No. 1072 College Drawing Instrument, containing—
1 Ruling Pen No. 1060B.
1 Steel Spring Bow Pencil, No. 1063.
1 " " " Pen, No. 1064.
1 Plain Divider with straightening device, No. 1065.
1 Compass, 5¼ inches, fixed needle point, pen, pencil points, lengthening bar and straightening device, key and box of leads, Set No. 1072.
1 Drawing Board, 16 × 21 inches.
1 T Square, hardwood lined, 24 inches.
1 German Silver Protractor, 6 inches.
1 Triangle, boxwood scale, 12 inches, divider 3-32 to 3.
1 Mahogany Triangle, 30-60°, 9 inches.
" " 45°, 8 "
1 Curve, No. 1880-15.
1 dozen Steel Tacks, No. 2370.
1 Koh-i-noor Pencil, 4-H.
1 Bottle Post's Waterproof Drawing Ink.
1 Ink and Pencil Eraser.
2 Sheets Koh-i-noor Tracing Cloth.
6 Sheets Whatman's Demy, CP.
Complete Outfit..... $11 50

No. 1092. Same outfit as No. 1090, but with instruments No. 1075 in pocketbook case, in place of No. 1072.
Complete Outfit..... 13 75

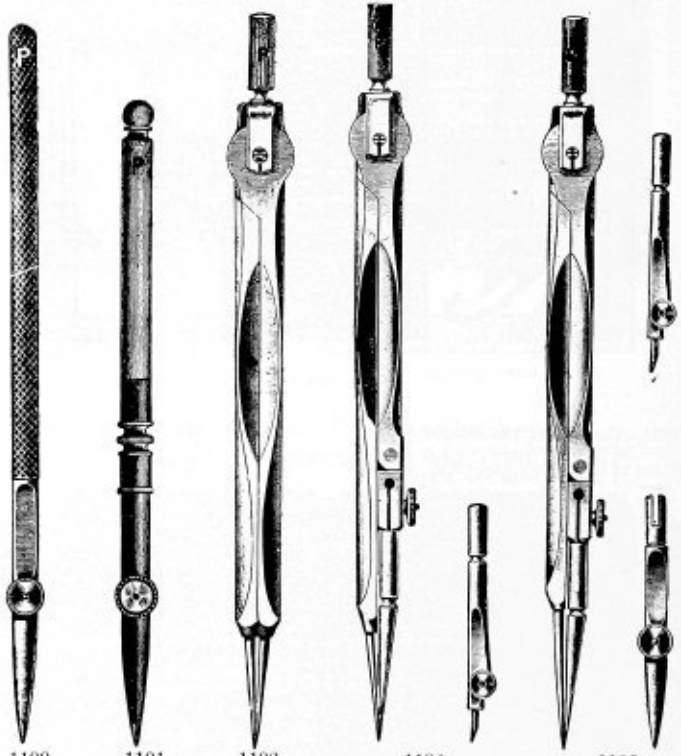
NICKEL-PLATED SCHOOL INSTRUMENTS

Especially made up for Elementary Grades of Schools

These instruments will not tarnish or rust and are far superior to the line of French Brass Instruments formerly listed by us.

For description of quality, see page 73

Illustrations two-thirds size



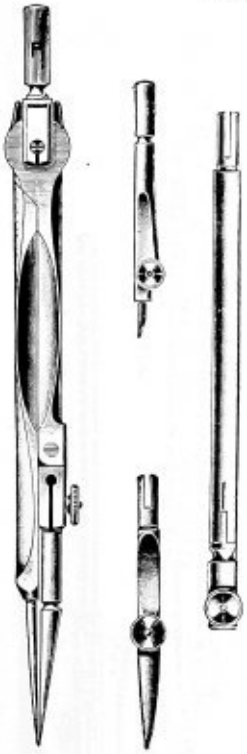
1100 1101 1102 1104 1105

		Each
No. 1100.	Ruling Pen, 5 inches, with release, metal handle	$0 25
1101.	" " 5 " no " bone "	30
1102.	Plain Divider, 5 inches, with straightening device	40
1103.	" " 5½ " " " "	50
1104.	Compasses, 5½ inches, with needle and pencil point, straightening device	70
1105.	Compass, 5½ inches, with needle, pen and pencil point, straightening device	90

NICKEL-PLATED SCHOOL INSTRUMENTS —Continued

Especially made up for Elementary Grades of Schools

Illustrations two-thirds size



1106

1109 1110

		Each
No. 1106.	Compasses, 5½ inches, with needle point, pen, pencil and lengthening bar, straightening device	$1 00
1109.	Combination Bow Pen and Pencil, 3½ inches, circular spring, metal handle	1 00
1110.	Bow Pen, 3½ inches, circular spring, metal handle	80

SCHOOL DRAWING INSTRUMENTS

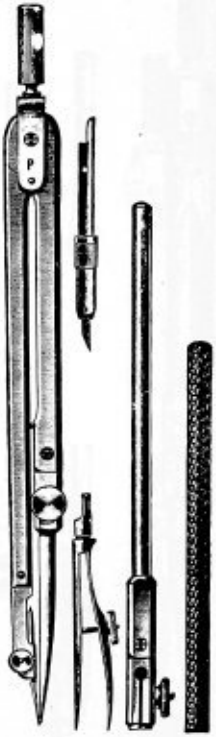
Nickel Plated **Flat System**

German silver with steel points

Illustrations two-thirds size

1113

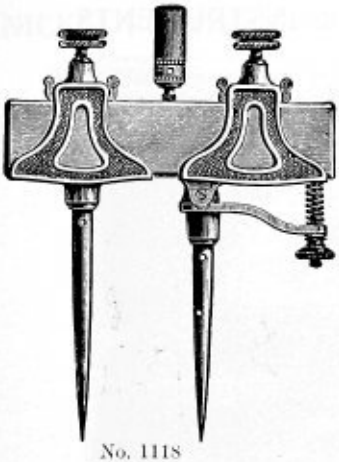
1114



1115

		Each
No. 1113.	Plain Divider, 5¼ inches	$0 65
1114.	Compasses, 5¼ inches, with needle point, pen, pencil points	1 10
1115.	" 5¼ " " " " " " point and lengthening bar	1 40

These instruments are listed in sets. See Nos. 1032 to 1038 on pages 154 to 156



No. 1118

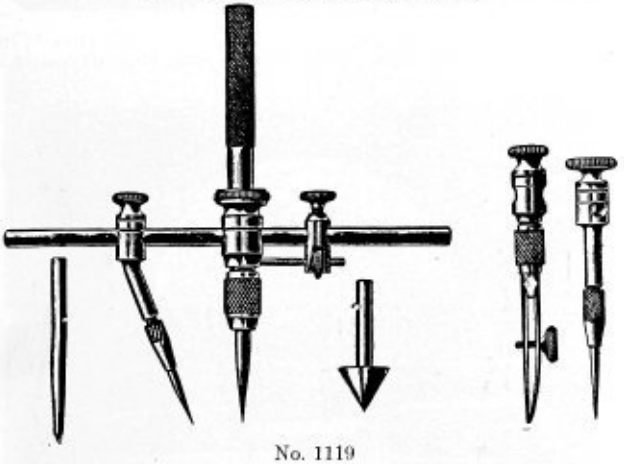
IMPROVED TRAMMEL POINTS

Nickel Plated

No. 1117. Trammel Points, to fit wooden bar with 3-inch fixed steel point, steel point and pencil. Each $1 50

No. 1118. Trammel Points, to fit wooden bar with 3-inch fixed steel point, steel point and pencil, with micrometer adjustment. Each 2 50

UNIVERSAL DIVIDERS



No. 1119

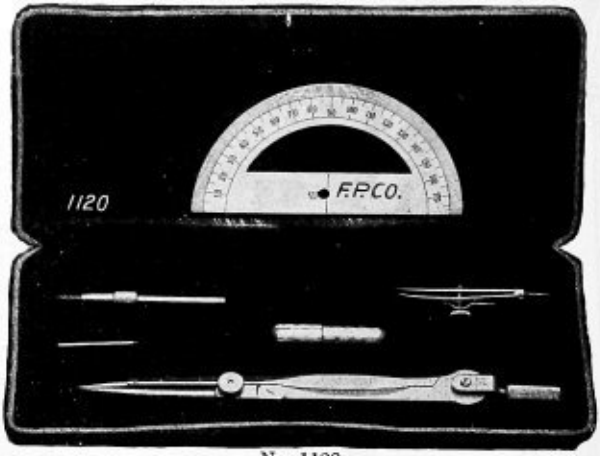
No. 1119. Universal Dividers, can be used by draughtsmen or mechanics. Contains one 13-inch metal bar, so a circle of 25 inches can be drawn, pen, pencil, 1 each straight and bent needle or pencil point, also blunt center point to be used when scribing around a drilled hole. Complete $3 75

For Beam Compass Bars, see page 225

NICKEL-PLATED SCHOOL INSTRUMENTS

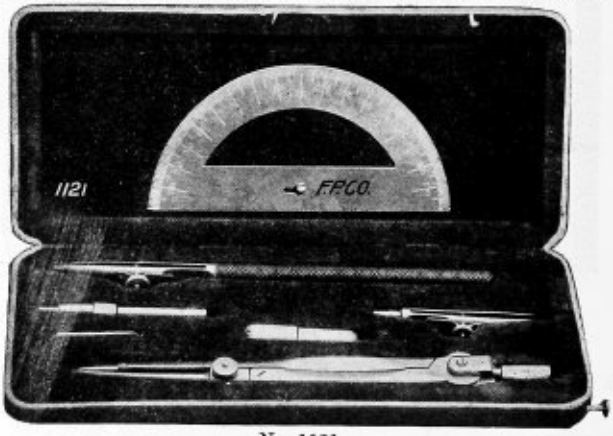
In Cases

Especially made up for Elementary Grades of Schools



No. 1120

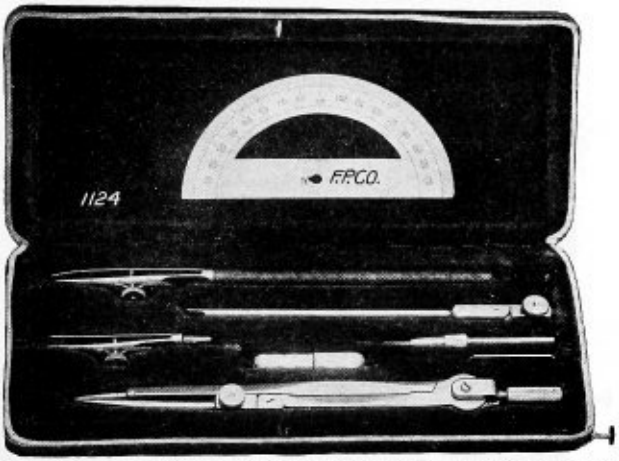
No. 1120. Pocket Case, containing nickel-plated compasses, No. 1105, 5¼ inches, with pencil and pen points, metal protractor, key and box of leads. Per set.....$1 00



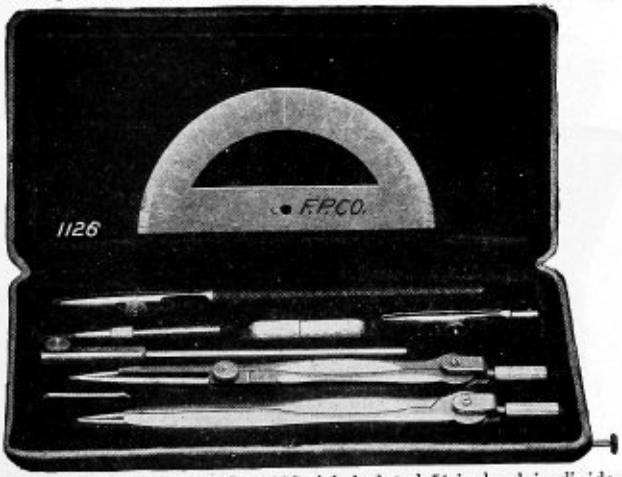
No. 1121

No. 1121. Pocket Case, containing nickel-plated compasses, No. 1105, 5¼ inches, with pencil and pen points and ruling pen No. 1100, metal protractor, key and box of leads. Per set.....$1 25

NICKEL-PLATED SCHOOL INSTRUMENTS —Continued



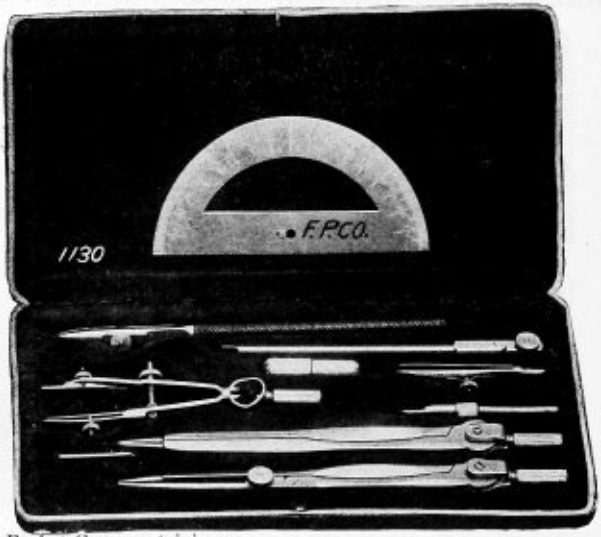
No. 1124. Pocket Case, containing nickel-plated compasses, No. 1106, 5½ inches, with pencil and pen points and lengthening bar, ruling pen No. 1100, metal protractor, key and box of leads. Per set.....$1 40



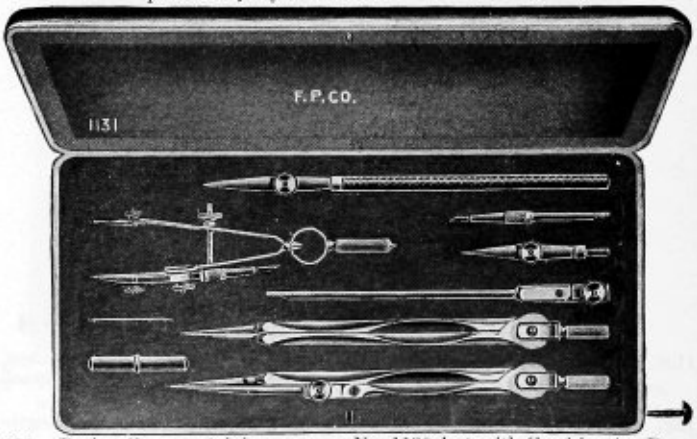
No. 1126. Pocket Case, containing No. 1103 nickel-plated 5½-inch plain dividers, 5-inch ruling pen No. 1100, 5½-inch compasses No. 1105, with pencil and pen points, metal protractor and box of leads. Per set.....$1 80

1127. . Pocket Case, same as No. 1126 but with compass No. 1106 with lengthening bar, in place of No. 1105 compass. Per set..... 2 00

NICKEL-PLATED SCHOOL INSTRUMENTS —Continued



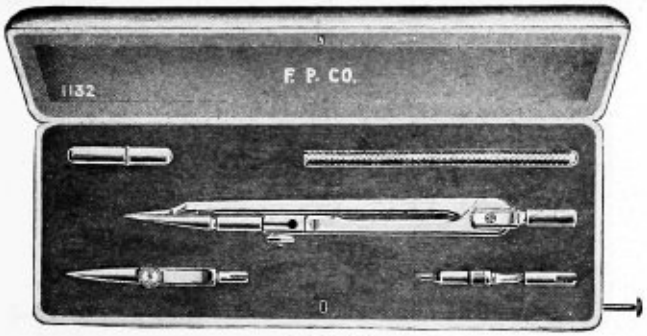
No. 1130. Pocket Case, containing:—
No. 1130 Nickel-plated plain divider, 5½ inches.
No. 1106 Nickel-plated compasses, 5½ inches, pen, pencil, points and lengthening bar.
No. 1110 Bow pen, 3½ inches, circular spring, metal handle.
No. 1100 Ruling pen, 5 inches, with release, metal handle, metal protractor, key and box of leads. Per set.....$2 50



No. 1131. Pocket Case, containing same as No. 1130, but with Combination Bow Pen and Pencil. Per set.....$2 75

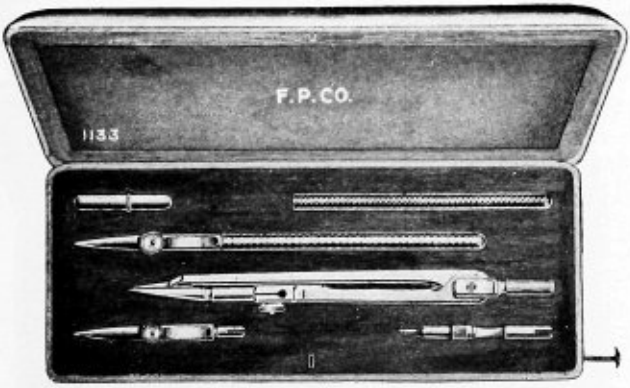
SCHOOL DRAWING INSTRUMENTS

Flat System
German silver and steel points
In Cases



No. 1132

No. 1132. In Pocket Case, containing:—
No. 1114 German silver compass, 5¼ inches, with needle points, pen and pencil points, key and box of leads.
Per set.....$1 30

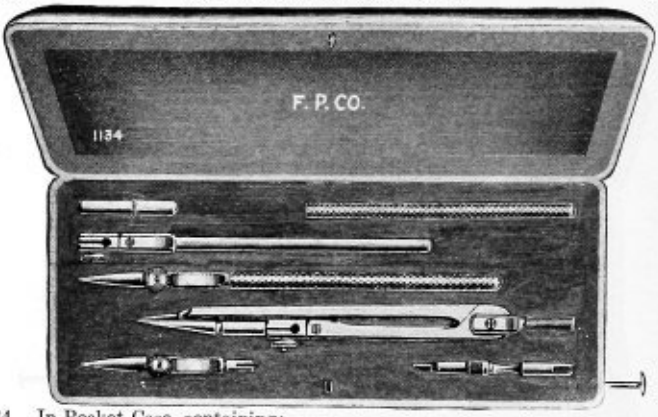


No. 1133

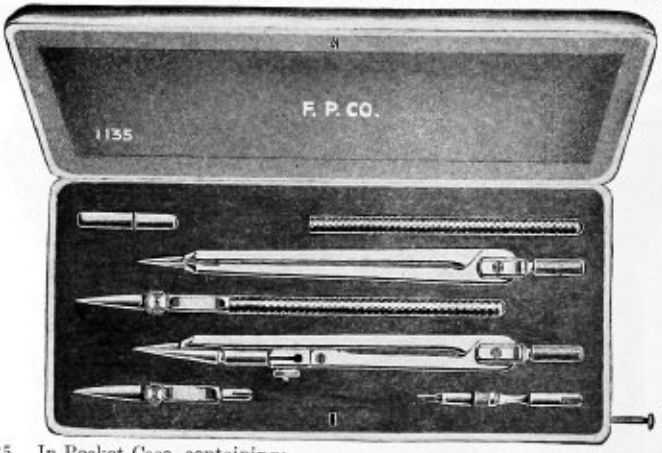
No. 1133. In Pocket Case, containing:—
No. 1114 German silver compass, 5¼ inches, with needle point, pen and pencil points.
No. 1100 Ruling pen, 5 inches, with release, metal handle, key and box of leads.
Per set.....$1 70

SCHOOL DRAWING INSTRUMENTS —Continued

Flat System German silver with steel points **In Cases**



No. 1134. In Pocket Case, containing:—
No. 1115 German silver compass, 5¼ inches, with needle pen, pencil points and lengthening bar.
No. 1100 Ruling pen, 5 inches, with release, metal handle, key and box of leads. Per set.....$2 00

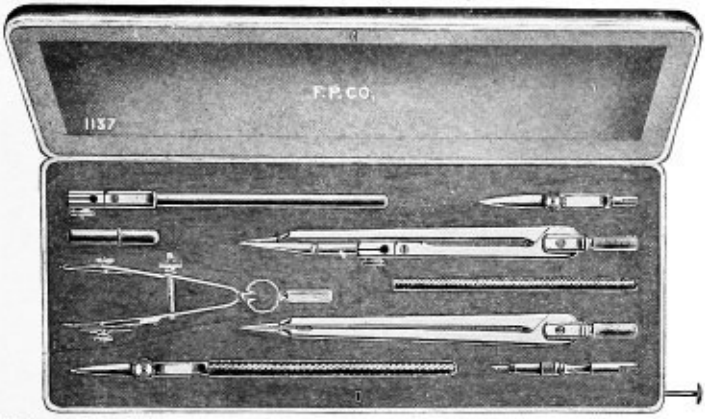


No. 1135. In Pocket Case, containing:—
No. 1113 German silver plain divider, 5¼ inches.
No. 1114 German silver compass, 5¼ inches, with needle pen, pencil point.
No. 1100 Ruling pen, 5 inches, with release, metal handle, key and box of leads. Per set.....$2 50

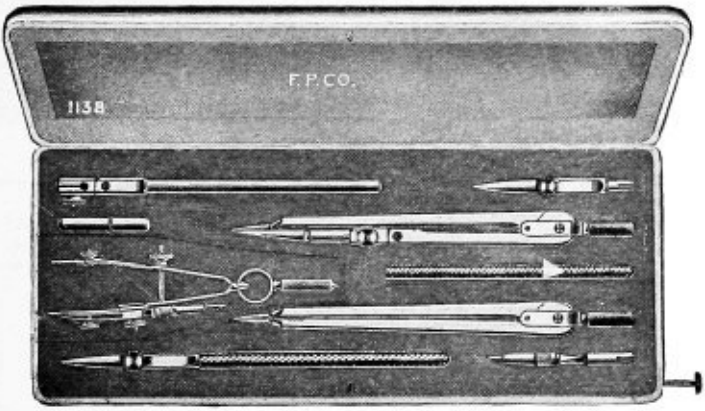
No. 1136. In Pocket Case, containing:—
Same as No. 1135 but with compass No. 1115 having lengthening bar, in place of No. 1114. Per set.....$2 75

SCHOOL DRAWING INSTRUMENTS —Continued

Flat System German silver with steel points **In Cases**



No. 1137. In Pocket Case, containing:—
No. 1113 German silver plain divider, 5¼ inches.
No. 1115 German silver compass, 5¼ inches, with needle pen, pencil point and lengthening bar.
No. 1110 Bow Pen, 3½ inches, circular spring, metal handle.
No. 1100 Ruling pen, 5 inches, with release, metal handle, key and box of leads. Per set..... $3 25

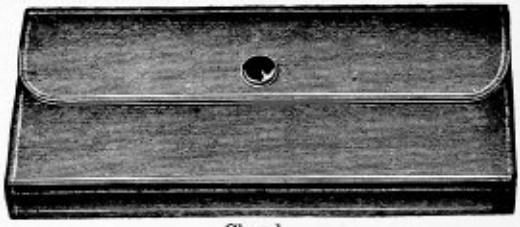


No. 1138. Containing same as No. 1137, but with Combination Bow Pen and Pencils. Per set..... $3 50

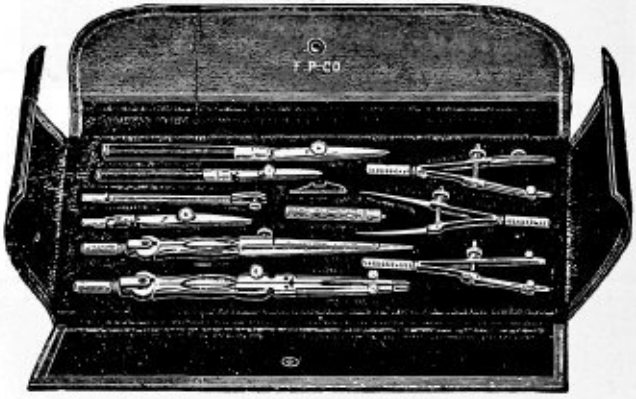
EMPTY POCKET CASES

MADE FOR ANY ASSORTMENT OF INSTRUMENTS

These cases are made of morocco leather and lined with silk velvet, "Pocket-Book" shape; also made regular style. The instruments are more compact in pocket-book case.



Closed



Style A Pocket-Book Case—Open

Polished wooden cases with lock and tray furnished to order. We recommend the morocco cases because they are more serviceable.

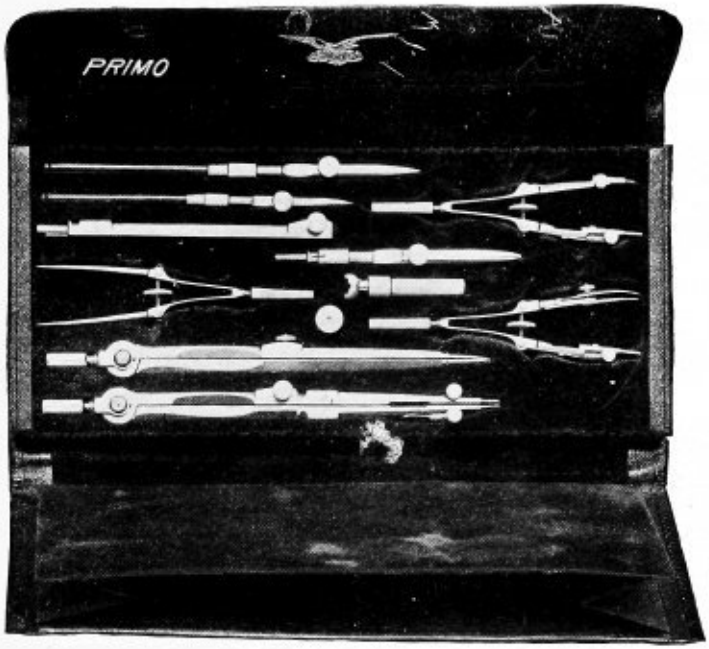
Size of Case	Lined with Blue Cotton Velvet	Lined with Green Silk Velvet
2½ × 6 inches	Each, $1 30	Each $1 50
3 × 7½ "	" 1 70	" 2 00
3½ × 9 "	" 2 00	" 2 50
5 × 9 "	" 2 35	" 2 90
5 × 12½ "	" 3 60	" 4 40
6 × 10 "	" 3 20	" 4 00
7 × 11 "	" 3 70	" 4 50
7 × 13 "	" 4 20	" 5 00

Any other size made to order at corresponding prices

EMPTY POCKET CASES —Continued

MADE FOR ANY ASSORTMENT OF INSTRUMENTS

These cases are made of morocco leather and lined with green silk velvet, "Pocket-Book" shape, with pocket.



Style B Pocket-Book Case—Open

Lined with green silk velvet

Size of Case	Each
2¼ × 6 inches	$2 00
3 × 7½ "	2 50
3½ × 9 "	3 00
5 × 9 "	3 50
6 × 10 "	4 50
7 × 11 "	5 00
7 × 13 "	5 50
5 × 12½ "	5 00

Any other size made to order at correspondingly low prices

SEPARATE PARTS FOR DRAWING INSTRUMENTS

It is necessary to send us the Instruments to properly fit parts

	Primo	Round System
Pen, Pencil or Needle Point for 4½-inch Compass ..... Each,	$1 10	$1 10
" " " " 6 " " ..... "	1 25	1 25
Lengthening Bar ..... "	75	75
Screws and Nuts ..... "	25	25
Shouldered Needles ..... "	15	15
Ebony and Ivory Handles for Ruling Pens ..... "	25	25
Aluminum " " " " ..... "	25	25
Box with leads ..... "	15	15

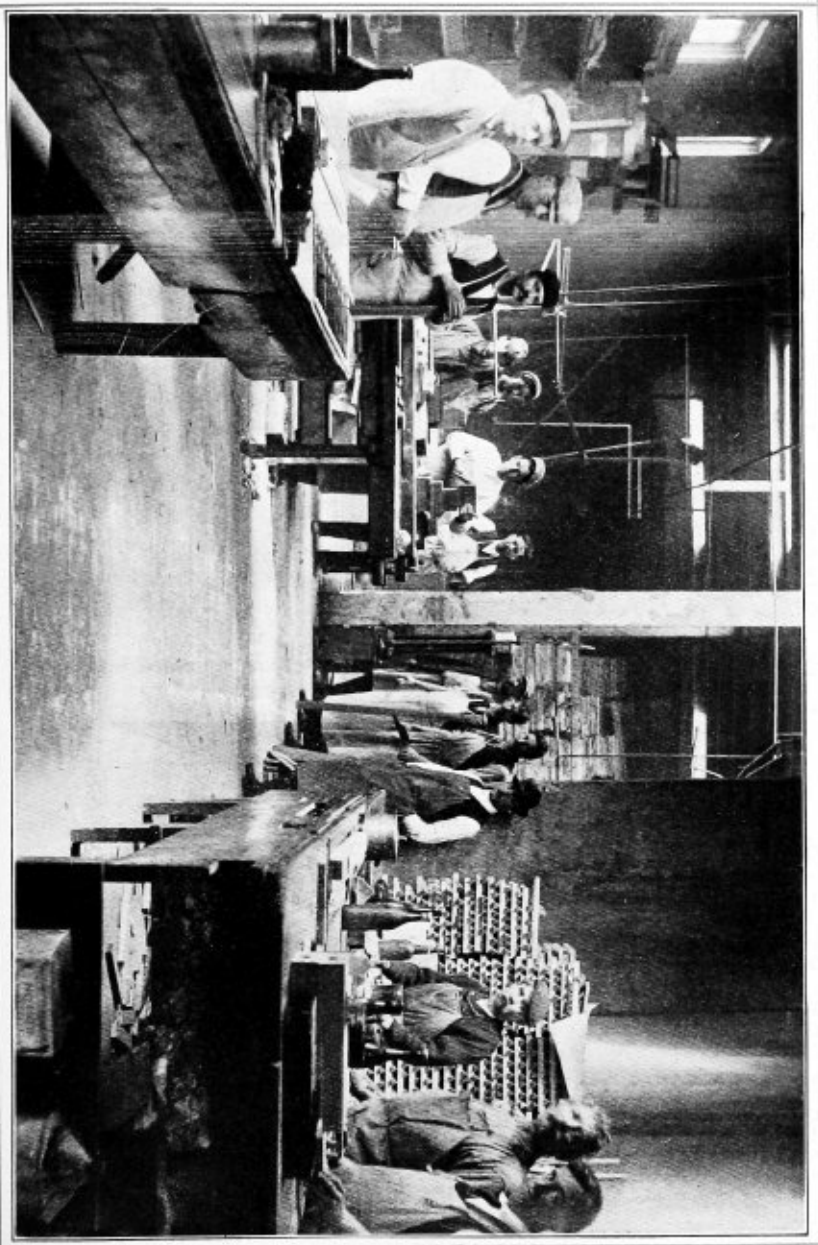
PARTS FOR CORONA INSTRUMENTS

Pencil Pen Needle point

Pen, Pencil or Needle Point parts for 4½-inch Compasses ..... Each,	$1 10
" " " " " 6 " " ..... "	1 25
Lengthening Bar ..... "	75
Screws and Nuts ..... "	25
Needles ..... "	15
Shouldered Needles for Bows ..... "	15
Handles for Ruling Pens ..... "	25
Box with leads ..... "	15

PARTS FOR EXCELSIOR, UNIVERSITY AND COLLEGE INSTRUMENTS

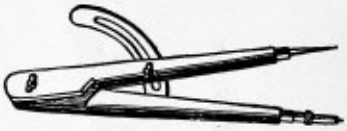
	Excelsior	University	College
Pen, Pencil or Needle Point parts for 4½-inch Compasses ..... Each,	$0 90	$0 60	$0 50
Pen, Pencil or Needle Point parts for 5½-inch Compasses ..... "	1 00	80	40
Lengthening Bars ..... "	60	50	35
Screws and Nuts ..... "	20	15	10
Shouldered Needles ..... "	15	10	10
Ebony and Ivory Handles for Ruling Pens .. "	20	20	20
Aluminum " " " " .. "	20	20	20
Box with leads ..... "	10	10	10



SCALE DEPARTMENT, FACTORY

WOODEN BLACKBOARD DIVIDERS

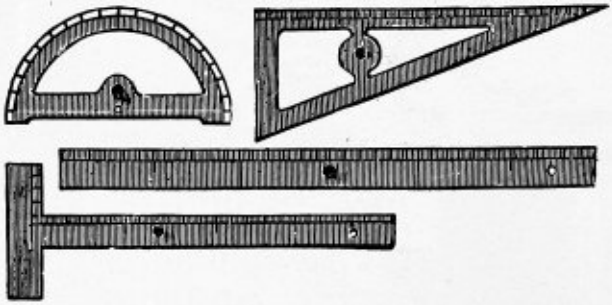
No. 1140.



No. 1143.

No. 1140.	Wooden Blackboard Dividers, 12 inches ..... Each,	$1 10
1141.	" " " 15 " ..... "	1 25
1142.	" " " 18 " ..... "	1 50
1143.	" " " with arc, 12 inches ..... "	1 50
1144.	" " " " " 15 " ..... "	1 75
1146.	" " " " " 18 " ..... "	2 00

BLACKBOARD SET



No. 1148.

No. 1148. Blackboard Set, with Knobs, consisting of T Square, 24 inches; Straight Edge, 36 inches; Protractor, 15½ inches; Triangle, 30 x 60 degrees, 24 inches. . . . . Per set, $5 00

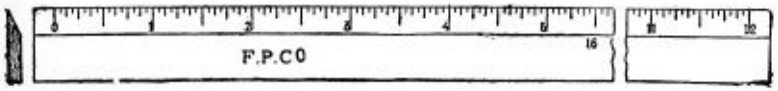
FLAT BOXWOOD SCALES

All our Scales are made of the best seasoned Boxwood.

The graduations are sharp and distinct, so that they will not tire or injure the eyes. Machine divided to accurate **U. S. Standard and Measurements.**

Beveled, one edge with but one division on each scale.

These scales having but one division were designed for the purpose of saving time, no error can be made to find the required division.



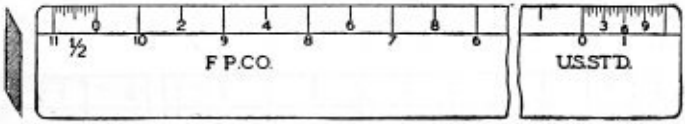
No. 1150. 12 inches long, divided to $\frac{1}{16}$-inch.

Architects' Scales, div., either 32ds, 3-32, $\frac{1}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1½, 2, 3, 4, 6 inches to the foot.

Engineers' Scales, div., either 10, 20, 30, 40, 50, 60 parts to the inch.

No. 1150.	Single Scale, divided to $\frac{1}{16}$-inch	Each,	$0 20
1151.	" " 12 " division as selected	"	20
1152.	" " 12 " divided either 80 or 100 parts to the in.	"	30
1154.	Per set of 4 Scales, in paper case, division as selected	"	1 80
1155.	" " " 8 " " " " " " "	"	3 00
1156.	" " " 12 " " wooden case, division as selected	"	4 00

These Scales are an improvement over the regular flat shape, as they may be picked up more readily, and present but one graduated bevel to the eye when in use.



1158.

Divided $\frac{1}{8}$, $\frac{1}{4} \times \frac{1}{2}$, 1 inch to the foot

No. 1157.	Opposite Bevel Boxwood Scale, 6 inches	Each,	$0 45
1158.	" " " " " 12 "	"	70

Divided $\frac{3}{8}$, $\frac{3}{4} \times 1\frac{1}{2}$, 3 inches to the foot

No. 1159.	Opposite Bevel Boxwood Scale, 6 inches	Each,	$0 45
1160.	" " " " " 12 "	"	70

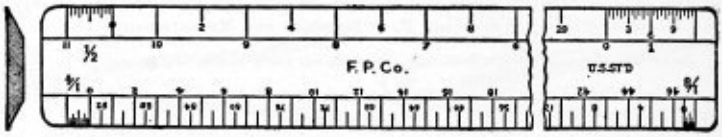
Chain Scale, divided 10 × 50 parts to the inch

No. 1161.	Opposite Bevel Boxwood Chain Scale, 6 inches	Each,	$0 45
1162.	" " " " " " 12 "	"	70

If special scales are ordered, a sketch showing divisions and numbering is required, and a remittance covering entire cost, figured at double list price of regular scales of the same kind.

FLAT BOXWOOD SCALES —Continued

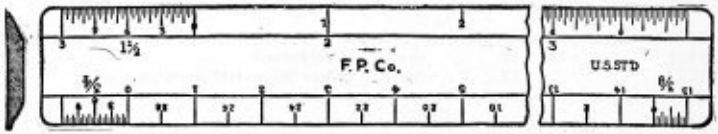
U. S. Standard Machine Divided



No. 1201.

Divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ and 1 inch to the foot.

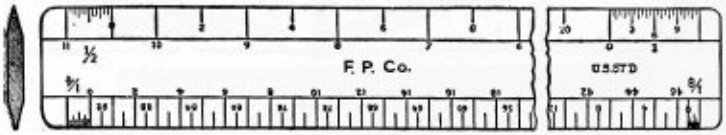
No. 1200.	Flat Boxwood Scale,	6 inches.			Each,	$0 45
1201.	" " "	12	"		"	70
1202.	" " "	12½	"		"	80
1203.	" " "	18	"		"	1 35
1204.	" " "	24	"		"	1 75



No. 1208.

Divided: $\frac{3}{8}$, $\frac{3}{4}$, 1½ and 3 inches to the foot.

No. 1206.	Flat Boxwood Scale,	6 inches.			Each,	$0 45
1208.	" " "	12	"		"	70
1210.	" " "	18	"		"	1 35
1212.	" " "	24	"		"	1 75



No. 1216.

Divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $1 \times \frac{1}{8}$, $\frac{3}{4}$, 1½, 3 inches to the foot.

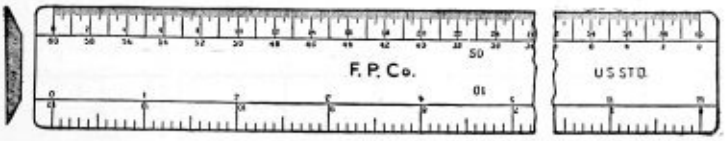
						Each.
No. 1214.	Flat Boxwood Scale,	6 inches, both sides beveled and divided				$0 80
1216.	" " "	12	"	" " " " " "		1 10
1218.	" " "	18	"	" " " " " "		2 25
1220.	" " "	24	"	" " " " " "		3 00

If Special Scales are desired, send sketch showing divisions and numbering and figure cost at double the list price of similar regular Scales.

FLAT BOXWOOD SCALES —Continued

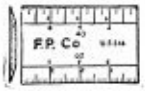
U. S. Standard Machine Divided

CHAIN SCALES



No. 1226.

			Each
No. 1222.	Flat Boxwood Chain Scale,	6 in., div. 10×50 parts to the inch	$0 45
1223.	" " " "	6 " " 20×40 " "	45
1224.	" " " "	6 " " 30×60 " "	45
1225.	" " " "	6 " " 80×100 " "	70
1226.	" " " "	12 " " 10×50 " "	70
1227.	" " " "	12 " " 20×40 " "	70
1228.	" " " "	12 " " 30×60 " "	70
1229.	" " " "	12 " " 80×100 " "	1 10



No. 1230.

			Each
No. 1230.	Flat Boxwood Offset Scale,	2 in., div. 10×50 parts to the inch	$0 40
1231.	" " " "	2 " " 20×40 " "	40
1232.	" " " "	2 " " 30×60 " "	40
1233.	" " " "	2 " " 80×100 " "	65

FLAT BOXWOOD METRIC SCALES

No. 1234.	Flat Boxwood Scale,	10 centimeters long	Each, $0 50
1235.	" " "	20 " "	" 65
1236.	" " "	30 " "	" 75
1238.	" " "	50 " "	" 1 50

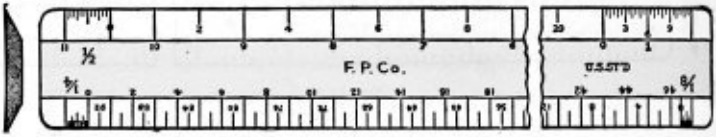
If Special Scales are desired, send sketch showing divisions and numbering, and figure price at double the list price of similar regular Scales.

FLAT WHITE EDGE SCALES

U. S. Standard Machine Divided

These Scales are made of selected and thoroughly seasoned boxwood, lined on edges with celluloid, a white material similar to ivory, which is unshrinkable and will not change color.

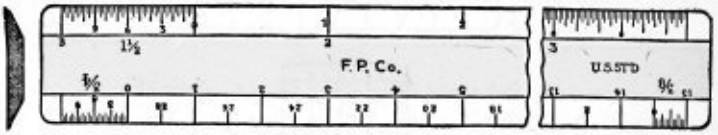
The White Edge Scales have attained a great deal of popularity from the fact that the graduations thereon are very distinct and wear better and are more legible than on Ivory Scales.



No. 1242.

Divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ and 1 inch to the foot.

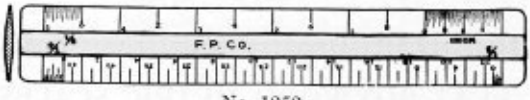
No. 1240.	Flat White Eagle Scale,			6	inches.		Each,	$0 70
1242.	"	"	"	"	12	"	"	1 10
1243.	"	"	"	"	12½	"	"	1 35
1244.	"	"	"	"	18	"	"	2 10
1246.	"	"	"	"	24	"	"	2 75



No. 1249.

Divided: $\frac{3}{8}$, $\frac{3}{4}$, 1½ and 3 inches to the foot.

No. 1248.	Flat White Edge Scale,			6	inches.		Each,	$0 70
1249.	"	"	"	"	12	"	"	1 10
1250.	"	"	"	"	18	"	"	2 10
1251.	"	"	"	"	24	"	"	2 75



No. 1252.

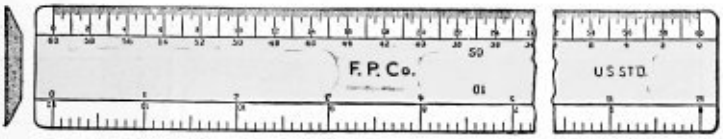
Divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1×$\frac{1}{8}$, $\frac{3}{4}$, 1½, 3 inches to foot.

No. 1252.	Flat White Edge Scale, 6 inches, both sides beveled and divided, in leather sheath, less than one inch wide, very convenient for the pocket.						Each,	$1 35
1253.	Flat White Edge Scale, 12 inches, both sides bev. and div.						"	2 00
1254.	"	"	"	"	18	"	"	3 50
1255.	"	"	"	"	24	"	"	4 50

If Special Scales are desired, send sketch showing divisions and numbering, and figure cost at double the list price of similar regular Scales.

FLAT WHITE EDGE SCALES —Continued

U. S. Standard Machine Divided

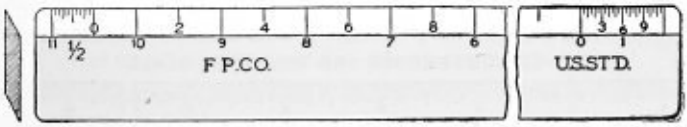


No. 1260.

			Each
No. 1256.	Flat White Edge Chain Scale, 6 in., div.	10×50 parts to inch	$0 70
1257.	" " " " " 6 " "	20×40 " "	70
1258.	" " " " " 6 " "	30×60 " "	70
1259.	" " " " " 6 " "	80×100 " "	90
1260.	" " " " " 12 " "	10×50 " "	1 10
1261.	" " " " " 12 " "	20×40 " "	1 10
1262.	" " " " " 12 " "	30×60 " "	1 10
1263.	" " " " " 12 " "	80×100 " "	1 50
1264.	" " " " " 12 " "	100×500 parts to ft.	1 25
1265.	" " " " " 12 " "	200×400 " "	1 25
1266.	" " " " " 12 " "	300×600 " "	1 25
1268.	" " " " " 12 " "	800×1000 " "	1 75

No. 1269. Flat White Edge Scale, 6 inch, both sides beveled and divided, 10, 30, 40, 50 parts to the inch. In leather sheath 1 35
Above scale is less than one inch wide and very convenient for the pocket.

OPPOSITE BEVEL WHITE EDGE SCALES



No. 1272.

Divided $\frac{1}{8}$, $\frac{1}{4}\times\frac{1}{2}$, 1 inch to the foot.

No. 1270.	White-edge Scale, Opposite Bevel, 6 inches	Each,	$0 70
1272.	" " " " 12 "	"	1 10

Divided $\frac{3}{8}$, $\frac{3}{4}\times1\frac{1}{2}$, 3 inches to the foot.

1275.	White-edge Scale, Opposite Bevel, 6 inches	Each,	$0 70
1276.	" " " " 12 "	"	1 10

If special Scales are desired, send sketch showing divisions and numbering, and figure cost at double the list price of similar regular Scales.

FLAT WHITE EDGE SCALES —Continued

U. S. Standard Machine Divided

METRIC SCALES

No. 1278C.

No. 1278½A. 10 centimeters long, White Edge ..... Each, $0 75
1278½B. 20 " " " " ..... " 1 00
1278½C. 30 " " " " ..... " 1 25
1278½D. 50 " " " " ..... " 2 25

INCH AND METRIC SCALES

No. 1278½E. Boxwood Scale, 30 cm., div. 32nds in. and half mm. ..... Each, $1 60
1278½F. White Edge Scale, 30 cm., " " " " " " ..... " 1 50

These scales are divided in inches on one edge and in metric measure on the other and therefore very convenient for converting plans from one system into the other.

METRIC COMPARING SCALE

No. 1279A.

No. 1279A. Flat Scale, white facing, 30 cm., div. mm. and 16 ft. on meridian lin. (not beveled) ..... Each, $1 50
1279B. Same as No. 1279A, but 50 cm ..... " 2 50

CIRCUMFERENCE AND DIAMETER SCALE

No. 1279½.

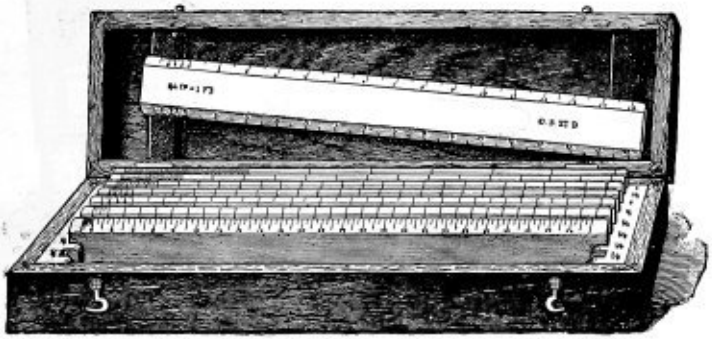
No. 1279½. Flat White Edge Scale, 12 in., div. for diameter and circumference. Each $1 75

This scale is divided in the ratio of the diameter to the circumference of a circle, one edge divided in inches to 32nds, the other to spaces 3.1416 in. to 128th.

If Special Scales are desired, send sketch showing divisions and numbering, and figure cost at double the list price of similar regular Scales.

FLAT BOXWOOD SCALES

IN SETS



No. 1281.

		Per set
No. 1280.	Set of 4 Boxwood Scales, 12 inches. Divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 inch to the foot	$ 4 25
1281.	Set of 8 Boxwood Scales, 12 inches. Divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 3 inches to the foot	7 50
1282.	Set of 12 Boxwood Scales, 12 inches. Divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 2, 3, 4, 6 inches to the foot	11 00
1283.	Set of 4 Boxwood Scales, 12 inches. Divided: 10 and 50, 20 and 40, 30 and 60, 80 and 100 parts to the inch	4 70

Nos. 1280 to 1283 have the same scale on both edges; one edge is divided and figured to read from left to right, and the other from right to left.

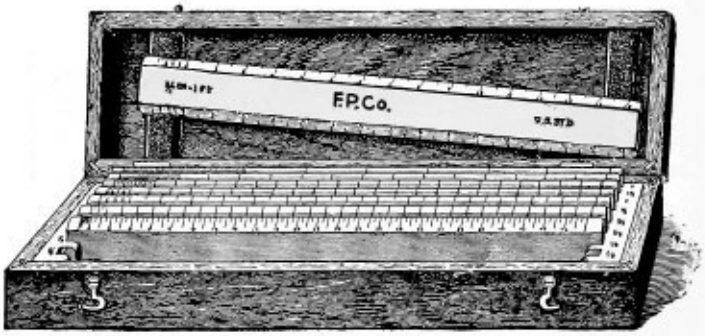
No. 1283 has a different scale on each edge; each of which is figured to read both ways.

		Per set
No. 1284.	Set of 6 Boxwood Scales, 12 inches. Divided: 10, 20, 30, 40, 50, 60 parts to the inch	$ 6 00
1285.	Set of 8 Boxwood Scales, 12 inches. Divided: 10, 20, 30, 40, 50, 60, 80, 100 parts to the inch	9 00

Nos. 1284 to 1285 have the same scale on both edges; each edge is figured to read both ways.

If Special Scales are desired, send sketch showing divisions and numbering, and figure cost at double the list price of similar regular Scales.

FLAT WHITE EDGE SCALES IN SETS



No. 1287.

		Per set
No. 1286.	Set of 4 White-Edge Scales, 12 inch. Divided: ¼, ½, ¾, 1 inch to the foot	$ 6 25
1287.	Set of 8 White-Edge Scales, 12 inch. Divided: ¼, ½, ¾, ¾, ¾, 1, 1½, 3 inches to the foot	11 50
1288.	Set of 12 White-Edge Scales, 12 inch. Divided: ¼, ½, ¾, ½, ¾, 1, 1½, 2, 3, 4, 6 and 12 inches to the foot	17 00

Nos. 1286-1287 have the same scale on both edges; one edge is divided and figured to read from left to right, and the other from right to left.

No. 1288 has a different scale on each edge, each of which is figured to read both ways.

		Per set
No. 1288A.	Set of 4 White-Edge Scales, 12 inch. Divided: 10 and 50, 20 and 40, 30 and 60, 80 and 100 parts to the inch	$ 6 75
No. 1289.	Set of 6 White-Edge Scales, 12 inch. Divided: 10, 20, 30, 40, 50, 60 parts to the inch	9 00
1290.	Set of 8 White-Edge Scales, 12 inch. Divided: 10, 20, 30, 40, 50, 60, 80, 100 parts to the inch	13 00

Nos. 1289 and 1290 have the same scale on both edges; each edge is figured to read both ways.

If Special Scales are desired, send sketch showing divisions and numbering, and figure cost at double the list price of similar regular scales.

TRIANGULAR BOXWOOD SCALES

U. S. Standard Machine Divided

Our Triangular Scales, both boxwood and white edge, are now made in two styles, the Regular shape and the Concaved Facet shape, as shown in the illustrations. The latter style insures closer contact with the drawing and a better angle of vision, while the former style gives a larger wearing surface.

REGULAR SHAPE

No. 1301.

Divided: $\frac{3}{32}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1½, 3 inches to the foot.

		Each
No. 1300.	Triangular Boxwood Scale, 6 inches, **regular** shape	$0 50
1301.	" " " 12 " " "	75
1302.	" " " 18 " " "	2 50
1303.	" " " 24 " " "	4 20

Divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1½, 2, 3, 4 inches to the foot.

No. 1305.	Triangular Boxwood Scale, 12 inches, **regular** shape	$0 75
1306.	" " " 18 " " "	2 50
1307.	" " " 24 " " "	4 20

CONCAVED FACET SHAPE

No. 1301C.

Divided: $\frac{3}{32}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1½, 3 inches to the foot.

		Each
No. 1300C.	Triangular Boxwood Scale, 6 inches, **concaved** facet shape	$0 60
1301C.	" " " 12 " " "	1 00
1302C.	" " " 18 " " "	2 50
1303C.	" " " 24 " " "	4 50

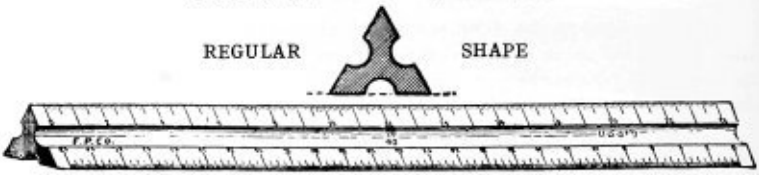
Divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1½, 2, 3, 4 inches to the foot.

No. 1305C.	Triangular Boxwood Scale, 12 inches, **concaved** facet shape	$1 00
1306C.	" " " 18 " " "	2 50
1307C.	" " " 24 " " "	4 50

TRIANGULAR BOXWOOD SCALES —Continued

U. S. Standard Machine Divided

REGULAR SHAPE

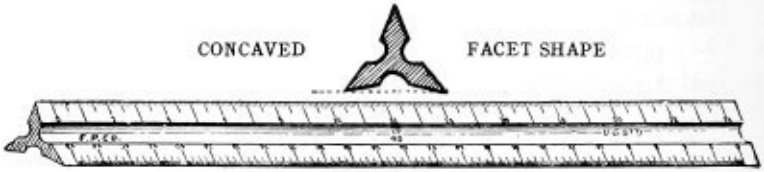


No. 1311.

	Divided: 10, 20, 30, 40, 50, 60 parts to the inch.	Each
No. 1310.	Triangular Boxwood Chain Scale, 6 inches, **regular** shape	$0 50
1311.	" " " " 12 " " "	0 75
1312.	" " " " 18 " " "	2 50
1313.	" " " " 24 " " "	4 20

	Divided: 20, 30, 40, 50, 60, 80 parts to the inch.	Each
No. 1315.	Triangular Boxwood Chain Scale, 12 inches, **regular** shape	$1 00
1316.	" " " " 18 " " "	2 50
1317.	" " " " 24 " " "	4 20
1318.	" " " " 12 " divided 100, 200, 300, 400, 500, 600 parts to the foot	1 50

CONCAVED FACET SHAPE



No. 1311C.

	Divided: 10, 20, 30, 40, 50, 60 parts to the inch.	Each
No. 1310.	Triangular Boxwood Chain Scale, 6 inches, **concaved** facet shape	$0 60
1311C.	" " " " 12 " " " "	1 00
1312C.	" " " " 18 " " " "	2 50
1313C.	" " " " 24 " " " "	4 50

	Divided: 20, 30, 40, 50, 60, 80, parts to the inch.	Each
No. 1315C.	Triangular Boxwood Chain Scale, 12 inches, **concaved** facet shape	$1 00
1316C.	" " " " 18 " " " "	2 50
1317C.	" " " " 24 " " " "	4 50
1318C.	" " " " 12 " divided 100, 200, 300, 400, 500, 600 parts to the foot	1 60

TRIANGULAR BOXWOOD METRIC SCALES

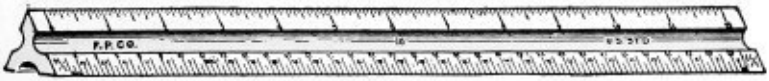
		Each
No. 1320.	Triangular Boxwood Scale, 20 cm., div. to mm. and ½ mm	$1 20
1321.	" " " 30 " " " " "	1 50
1322.	" " " 50 " " " " "	2 70

If special Scales are desired, send sketch showing divisions and numbering and figure cost at double the list price of similar regular Scales.

TRIANGULAR WHITE EDGE SCALES —Continued

U. S. Standard Machine Divided

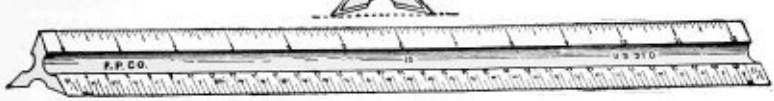
REGULAR SHAPE



No. 1331.

		Each
	Division: $\frac{3}{32}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1½, 3 inches to the foot.	
No. 1330.	Triangular White Edge Scale, 6 inches, regular shape	$1 50
1331.	" " " " 12 " " "	2 50
1332.	" " " " 18 " " "	4 50
1333.	" " " " 24 " " "	6 50
	Division: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1½, 2, 3, 4 inches to the foot.	Each
No. 1335.	Triangular White Edge Scale, 12 inches, regular shape	$2 50
1336.	" " " " 18 " " "	4 50
1338.	" " " " 24 " " "	6 50

CONCAVED FACET SHAPE



No. 1331C.

		Each
	Division: $\frac{3}{32}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1½, 3 inches to the foot.	
No. 1330C.	Triangular White Edge Scale, 6 inches, concaved facet shape	$1 50
1331C.	" " " " 12 " " "	2 50
1332C.	" " " " 18 " " "	4 50
1333C.	" " " " 24 " " "	6 50
	Division: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1½, 2, 3, 4 inches to the foot.	Each
No. 1335C.	Triangular White Edge Scale, 12 inches, concaved facet shape	$2 50
1336C.	" " " " 18 " " "	4 50
1338C.	" " " " 24 " " "	6 50

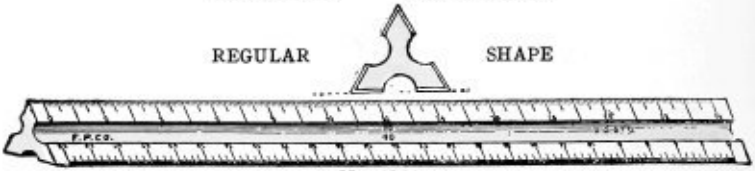
TRIANGULAR BOXWOOD OFFSET SCALES

			Each
No. 1339A.	2 in., divided 10×	50 parts to the inch	$0 60
1339B.	2 " " 20×	40 " " "	60
1339C.	2 " " 30×	60 " " "	60
1339D.	2 " " 80×	100 " " "	60

TRIANGULAR WHITE EDGE SCALES —Continued

U. S. Standard Machine Divided

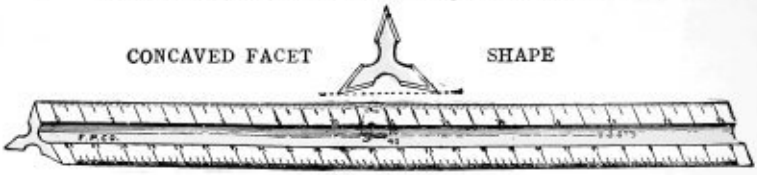
REGULAR SHAPE



No. 1341.

	Division: 10, 20, 30, 40, 50, 60 parts to the inch.	Each
No. 1340.	Triangular White Edge Chain Scale, 6 inches, regular shape	$1 50
1341.	" " " " " 12 " " " "	2 50
1342.	" " " " " 18 " " " "	4 50
1343.	" " " " " 24 " " " "	6 50
1345.	Triangular White Edge Chain Scale, 12 inches. Divided: 20, 30, 40, 50, 60, 80 parts to the inch	2 50
1346.	Triangular White Edge Chain Scale, 12 inches. Divided: 100, 200, 300, 400, 500, 600 parts to the foot	2 50

CONCAVED FACET SHAPE



No. 1341C.

	Division: 10, 20, 30, 40, 50, 60 parts to the inch.	Each
No. 1340C.	Triangular White Edge Chain Scale, 6 inches, concaved facet shape	$1 50
1341C.	" " " " " 12 " " " "	2 50
1342C.	" " " " " 18 " " " "	4 50
1343C.	" " " " " 24 " " " "	6 50
1345C.	Triangular White Edge Chain Scale, 12 inches. Divided: 20, 30, 40, 50, 60, 80 parts to the inch	2 50
1346C.	Triangular White Edge Chain Scale, 12 inches. Divided: 100, 200, 300, 400, 500, 600 parts to the foot	2 50

TRIANGULAR POCKET SCALES (BOXWOOD)

	Regular Shape.	Each
No. 1347.	3 inches long, divided like 1301, $\frac{3}{32}$—3 inches	$0 15
1348.	" " " " 1311 10—60 "	15

SCALE GUARD

No. 1350.

No. 1350. Triangle Scale Guard, nickel-plated ..... Each, $0 15

METALLIC TRIANGULAR SCALES

REGULAR SHAPE

No. 1352.

		Each
No. 1352.	Metallic Triangular Scale, 12 inches. Divided: $\frac{3}{32}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $1\frac{1}{2}$, 3 inches to the foot	$2 50
1353.	Metallic Triangular Scale, 12 inches. Divided: 10, 20, 30, 40, 50, 60 parts to the inch	2 50
1354.	Metallic Triangular Scales, 12 inches. Divided: 20, 30, 40, 50, 60, 80 parts to the inch	2 50

CONCAVED FACET SHAPE

No. 1355B.

These Metallic Scales, besides having the Concaved Facet shape which affords an easier reading of the scales, have the three fillets colored respectively black, yellow and red, very convenient for finding the required division.

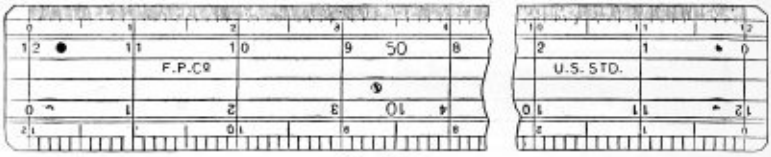
		Each
No. 1355A.	Improved Triangular Metallic Scale, Architects', 12 inches. Divided: $\frac{3}{32}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 3 inches to the foot, $\frac{1}{16}$ inch	$3 00
1355B.	Improved Triangular Metallic Scale, Engineers', 12 inches. Divided: 10, 20, 30, 40, 50, 60 parts to the inch	3 00
1355C.	Improved Triangular Metallic Scale, Engineers', 12 inches. Divided: 20, 30, 40, 50, 60, 80 parts to the inch	3 00

No 1356A.

The form of these scales makes them very practical for many purposes. They are made of steel, nickeled, with a dull finish; a 12 inch scale weighs $2\frac{1}{2}$ ounces. Each scale has two graduations, one on each edge.

										Each
No. 1356A.	Metal Scale,	12	inches,	divided	$\frac{1}{8}\times\frac{1}{4}$	inch	to	the	foot	$1 25
1356B.	" "	12	"	"	$\frac{1}{4}\times\frac{1}{2}$	"	"	"		1 25
1356C.	" "	12	"	"	$\frac{3}{8}\times\frac{3}{16}$	"	"	"		1 25
1356D.	" "	12	"	"	$\frac{1}{2}\times 1$	"	"	"		1 25
1356E.	" "	12	"	"	$\frac{3}{4}\times 1\frac{1}{2}$	"	"	"		1 25
1356F.	" "	12	"	"	$1\frac{1}{2}\times 3$	"	"	"		1 25

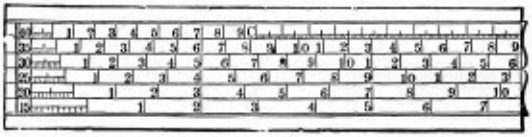
UNDERWRITER'S SCALES



No. 1360.

No. 1360. Flat Transparent Amber Underwriter's Scale, 6 in., both edges beveled and divided 10×50 parts to the inch ..... Each, $1 50
1361. Flat Underwriter's Scale, like No. 1360, but 12 inch ..... " 2 00

PLOTTING SCALES

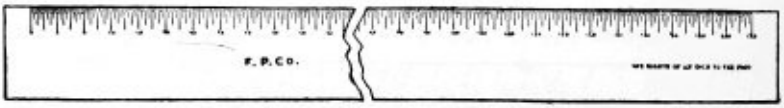


No. 1362.

No. 1362. Boxwood Plotting Scale, 6 inches ..... Each, $0 10
1363. Ivory Plotting Scale, 6 inches ..... " 90

PAPER SCALES

PRINTED ON BRISTOL BOARD



No. 1364.

No. 1364. Cardboard Scales, 18 inches long, full divided in ½ or ¼ or ⅛ or ½ or ¾ or 1 or 1½ or 3 inches to the foot.
Per set of these 8 scales $1 50
Single Scales ..... Each, 20

1365. Cardboard Scales, 18 inches long, full divided in 10 or 20 or 30 or 40 or 50 or 60 parts to the inch.
Per set of these 6 scales 1 10
Single Scales ..... Each, 20

1366. Metric Paper Scales, ½ meter long, divided in mm ..... " 20

1367. Metric and inch comparing Scale, ½ meter long ..... " 30

1368. Scale of proportional inches, 12 inches long, divided ⅛, ¼, ½ and 1 inch ..... " 10

MAP MEASURES

No. 1369.

No. 1369. Map Measure, 6 inches, white handle, dial with 2 graduations, inches to miles, and centimeters to kilometers.....Each $3 00

No. 1370.

1370. Map Measure, Watch Pattern, dial with 2 graduations, 12 inches in 8ths, and 25 feet.....Each 7 00

To measure it is only necessary to move the instrument over the surface. The small dial registers the feet, and the large one the inches. When 25 feet have been traversed, the small hand has made a complete revolution, and begins the second one, etc.

SHRINKAGE RULES

FOR SINGLE AND DOUBLE SHRINKAGE

No. 1371.

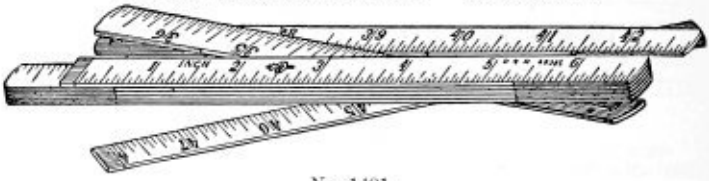
These rules are of hard wood, brass tipped, about 1½ inches wide by ¼ inch thick and divided to ⅛, 1/10, 1/12 and 1/16 inches.

			Each
No. 1371.	Shrinkage Rule, 24 8/10 equal 24 inches		$1 20
1372.	" " 24¼ " 24 "		1 20
1373.	" " 24⅜ " 24 "		1 20
1374.	" " 24½ " 24 "		1 20
1375.	" " 25 " 24 "		1 20
1376.	" " 25½ " 24 "		1 20
1377.	" " 26 " 24 "		1 20
1378.	" " 26¼ " 24 "		1 20

FOLDING POCKET RULES

Yellow Finish Brass Tipped

Boxwood, with Self-Locking Springs Invisible Joints



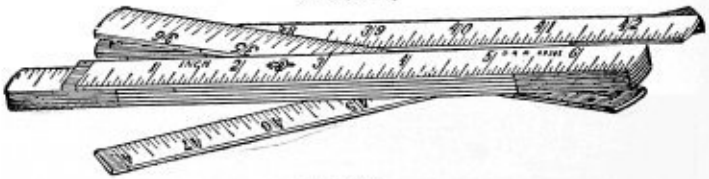
No. 1401.

These Pocket Rules are thin and light, and more convenient than the common joint rules. By a peculiar preparation of the wood, shrinkage is entirely prevented.

No. 1400.	2 feet,	4 fold,	inches	both sides				Each,	$0 20
1400½,	3 "	4 "	"	"	"			"	25
1401.	4 "	8 "	"	"	"			"	40
1402.	4 "	8 "	"	one side, metric on other				"	40
1404.	5 "	10 "	"	both sides				"	50
1406.	6 "	12 "	"	"	"			"	60
1408.	8 "	16 "	"	"	"			"	75

White Enameled with Brass Tips Invisible Joints

Best Quality



No. 1412.

These Folding Rules are covered with a white enameled coating, the black graduations being more legible and distinct where shown on the white surface; no rivets shown on surface.

These rules are not affected by heat or moisture and are easily cleaned.

No. 1410.	Pocket Rule,	2 feet,	4 fold,	with springs				Each,	$0 35
1411.	" "	3 "	6 "	"	"			"	40
1412.	" "	4 "	8 "	"	"			"	60
1413.	" "	5 "	10 "	"	"			"	70
1414.	" "	6 "	12 "	"	"			"	85
1415.	" "	8 "	16 "	"	"			"	1 00
1416.	" "	4 "	8 "	(meters)	with springs			"	40

FOLDING POCKET RULES —Continued

VEST POCKET SIZE

$\frac{3}{4}$-inch wide

Yellow Finish with Brass Tips

Invisible Joints

No. 1420–2.

No. 1420.	Pocket Rule, 2 feet, 6 fold,						$\frac{1}{16} \times \frac{1}{16}$	inch, with springs					Each,	$0 25
1421.	"	"	3	"	9	"	$\frac{1}{16} \times \frac{1}{16}$	"	"	"			"	40
1422.	"	"	4	"	12	"	$\frac{1}{16} \times \frac{1}{16}$	"	"	"			"	55

White Enameled with Brass Tips

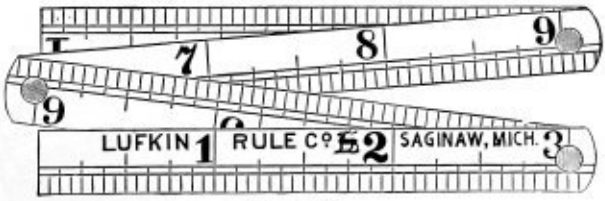
Invisible Joints

No. 1423–5.

No. 1423.	Pocket Rule, 2 feet, 6 fold,						$\frac{1}{16} \times \frac{1}{16}$	inch, with springs					Each,	$0 45
1424.	"	"	3	"	9	"	$\frac{1}{16} \times \frac{1}{16}$	"	"	"			"	55
1425.	"	"	4	"	12	"	$\frac{1}{16} \times \frac{1}{16}$	"	"	"			"	70

FOLDING STEEL POCKET RULES

For Surveyors

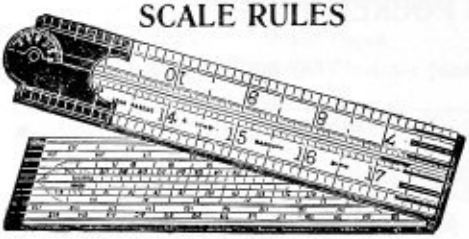


No. 1426A.

No. 1426A.	1 foot, 4 fold, inches one side, 10ths on other												Each,	$0 30
1426B.	2 feet, 8	"		"		"		"		"			"	55
1426C.	3	"	12	"		"		"		"			"	80

Nos. 1426A and 1426C Steel Rules come in neat leather pocket case

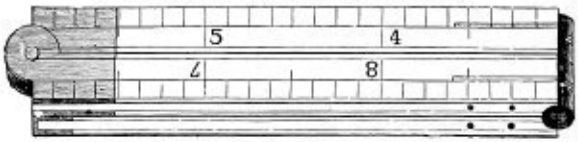
SCALE RULES



No. 1427A.

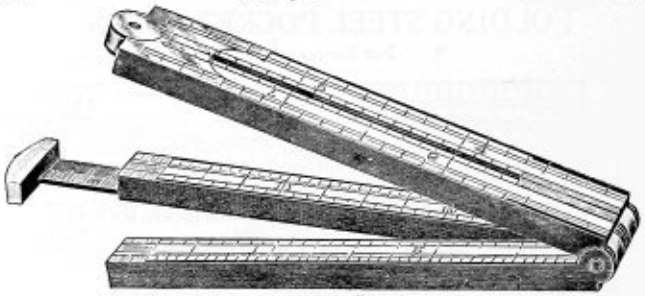
		Each
No. 1427A.	Architect's Scale Rule, with Beveled Edges, Boxwood, 2 feet, 4 folds, Brass Mountings, with Scales on Beveled Edge	$0 80
1427B.	Architect's Scale Rule, with Beveled Edges, Ivory, German Silver Mounted, 2 feet, 4 folds, with Scales on Beveled Edges	8 00

FOLDING POCKET RULES



No. 1428C.

								Each
No. 1428A.	Pocket Rule, Boxwood, 1 foot, 4 fold, brass mountings							$0 15
1428B.	"	"	"	2 feet, 4	"	"	"	30
1428C.	"	"	"	1 foot, 4	"	brass bound edges		40
1428D.	"	"	"	2 feet, 4	"	"	"	50
1428E.	"	"	Ivory, 1 foot, 4 fold, German silver mountings					1 00
1428F.	"	"	"	2 feet, 4	"	"	"	3 75
1428G.	"	"	"	1 foot, 4	"	"	" bound edges	2 00
1428H.	"	"	"	2 feet, 4	"	"	" " "	5 00



No. 1429B.

		Each
No. 1429A.	Pocket Rule, Boxwood, with Caliper, ½ foot, 2 folds, brass mountings	$0 25
1429B.	Pocket Rule, Ivory, with Caliper, 1 foot, 4 folds, brass bound edges	60
1429C.	Pocket Rule, Ivory, with Caliper, ½ foot, 2 folds, German silver mountings	75
1429D.	Pocket Rule, Ivory, with Caliper, 1 foot, 4 folds, German silver bound edges	3 50

EXTENSION RULES

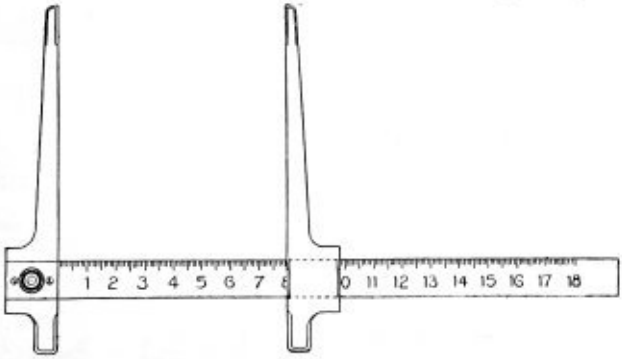
No. 1430A.

IN THREE SECTIONS, WITH SET SCREWS

For convenience in measuring, the three section rules are graduated on one side only in feet, inches and 8ths. Fitted with our patent locking device which automatically holds the sliding joints in their proper place, enabling one to instantly arrive at the correct measurement and avoiding all the confusion incident to other rules of this class.

No. 1430A.	Maple, 2 to 6 feet	Each,	$3 50
1430B.	" 3 to 9 "	"	3 75
1430C.	" 4 to 12 "	"	4 50

FORESTERS' TREE CALIPERS



No. 1430H.

No. 1430H.	**Foresters' Tree Caliper.** Selected hardwood. 18-inch, 1 clamp nut	Each,	$3 15
1430I.	**Foresters' Tree Caliper.** Selected hardwood. 30-inch, 2 clamp nut	Each,	4 15
1430K.	**Foresters' Tree Caliper.** Selected hardwood. 50-inch, 2 clamp nut	Each,	5 45

These calipers are made of selected, well seasoned hardwood, best workmanship and perfect finish, beam graduated on both sides to 10ths of inches and plainly numbered. Both arms are detachable for convenience in transportation. The eye of the sliding arm is brass lined. The stationary arm is held by **brass clamp nuts with lock nut.**

F. P. CO. SLIDE RULES

The slide rule is a mathematical instrument by aid of which all problems involving multiplication and division, powers and ratios can be solved in the speediest possible manner and with less chance of error than by ordinary calculation.

All of our slide rules listed below are manufactured with the utmost care and with improved special machinery.

The numbering is very clear and distinct and as permanent as possible.

MANNHEIM SLIDE RULES

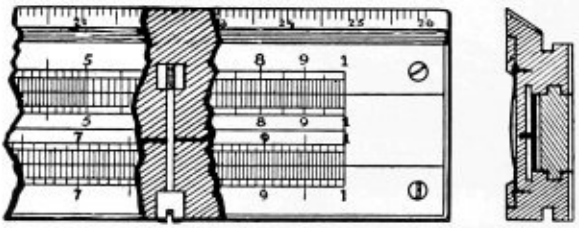
Arranged in this form first by Lieut. Mannheim. The Mannheim Slide Rule has been improved upon continuously and in its present perfected state has become practically indispensable, not only to the engineer and scientist, but also to every business man, whose daily task involves calculations.

The successful operation of the slide rule does not require a knowledge of the underlying principles but simply a few elementary rules, which are easily acquired and after a little practice its operation becomes practically automatic.

The slide rules listed below are made of the best selected mahogany stock covered with celluloid facing, screwed on to the wood on the end in order to avoid a loosening of the celluloid cover.

The tables on the back are covered with transparent celluloid, so as to avoid the wear and make them as permanent as possible.

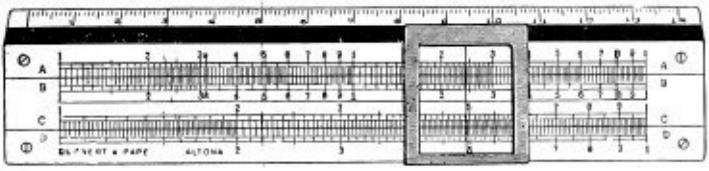
Our slide rules have all the valuable improvements made from time to time in order to prevent the shrinking and warping through atmospheric variations, on account of which the old style Mannheim rules were often rendered imperfect, as the slide would either work too loose or else so tight that it could not be handled properly. In order to overcome this objection, they have been fitted with adjusting springs and screws, which insure an accurate adjustment, and perfect workings of the rules. On account of this important feature our slide rules are superior to any other rule on the market.



Cross-section and cut, showing spring and screw adjusting device, used on our improved slide rules.

F. P. CO.'S ADJUSTABLE AND SPECIAL SLIDE RULES

All the Slide Rules listed below are fitted with our adjusting spring and screws, described on the preceding page.



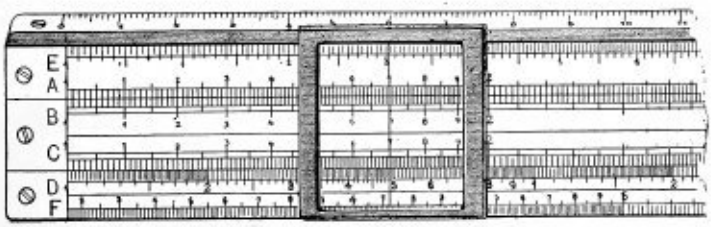
No. 1431.

No. 1431. F. P. Co.'s. **"Adjustable"** Slide Rule, 5-inch, with adjusting spring and screws, machine divided, on white celluloid facing, aluminum framed glass indicator, in case with directions ..... Each, $ 3 50

1432. F. P. Co's. **"Adjustable"** Slide Rule, same as No. 1431, but 10 inches long ..... Each, 4 25

1433. F. P. Co's. **"Adjustable"** Slide Rule, same as No. 1431, but 20 inches long ..... Each, 12 50

F. P. CO.'S ENGINEERS' SLIDE RULES



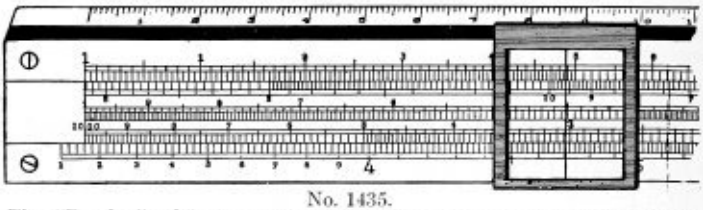
No. 1434.

The "Engineers'" Slide Rule does not only accomplish all the work of the Mannheim but in addition allows the direct reading of logarithmic cubes and cube roots.

No. 1434. F. P. Co's. **"Engineers'"** Slide Rule, 10 inch, machine divided on white celluloid facings, with adjustment spring and screws, aluminum framed glass indicator, in case with directions ..... Each, $5 00

We also make a number of other special slide rules, which we do not list in this catalogue, but shall be glad to send particulars upon request

F. P. CO.'S EUREKA SLIDE RULES



No. 1435.

The "Eureka," while in construction and operation similar to the Mannheim Slide Rule, does not only solve all arithmetical and logarithmic examples in the same rapid and convenient manner, but also embodies the following important and characteristic advantages.

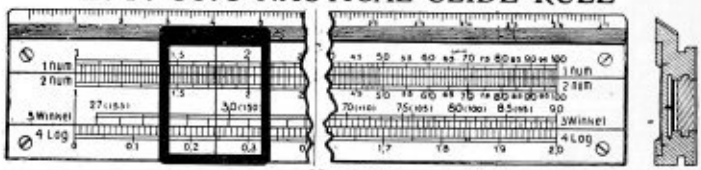
1. Direct reading of the three halves and two thirds powers.
2. Division of one number by two numbers in one setting.
3. Multiplication of three numbers in one setting.
4. More convenient solution of inverse proportion.
5. Direct solution in a single setting of a series of divisions with a constant dividend.
6. Direct reading of cubes and cube roots.
7. Direct solution in a single setting of many combined operations, which require the slide to be shifted with the Mannheim rule.

Reciprocal scales of the values of squares and cubes are placed on the back of the slides, by means of which it is possible to read direct the corresponding squares and cube roots. The reverse slide gives a table of squares and cubes, square roots and cube roots, twice as accurate as on the usual slide rules.

No. 1435. F. P. Co's. **"Eureka"** Slide Rule, 5 inches, of selected mahogany stock, adjusting device, machine divided on white facing, aluminum framed glass indicator, in case with directions.....Each, $3 00

1436. F. P. Co's. **"Eureka"** Slide Rule, same as No. 1435, but 10 inches long.....Each, 3 50

F. P. CO.'S NAUTICAL SLIDE RULE



No. 1437.

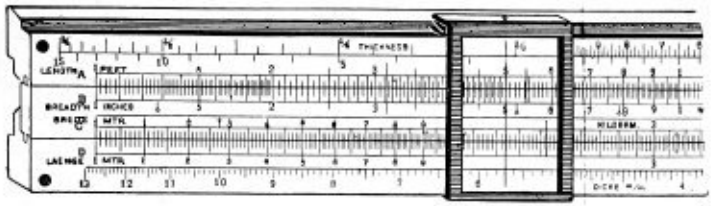
The "Nautical," in addition to solving the problems of multiplication and division in the usual manner, allow also the calculation of powers and roots with any exponent by means of a linear (not logarithmical) table. With the aid of sines, cosines and tangent tables on the slide and an angle measure on the reverse of the slide, most problems of nautical triangulation and measurements can be easily solved. It has therefore been called the "Nautical."

No. 1437. F. P. Co's. **"Nautical"** Slide Rule, 10 inches, machine divided on white celluloid facings, with aluminum framed glass slide adjustment screws, in case with directions.....Each, $5 50

We also make a number of other special slide rules, which we do not list in our catalogue, but shall be glad to send particulars upon request

F. P. CO.'S SLIDE RULE

LOGARITHMIC



No. 1438.

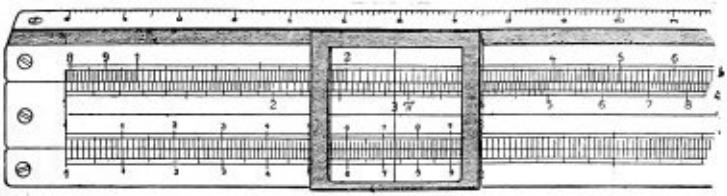
The "Logarithmic" Slide Rule, besides accomplishing all the usual mathematical calculations, measures the weight of metals, in one setting for sheet iron, pipes, bars, etc.; in two settings for cylindrical or spherical articles; also for sheets of any other metal than steel or iron.

Calculations and weight measurements are being operated absolutely independently from each other and are therefore simple, clear and accurate. Weight measurements with the ordinary rule are very complicated and therefore often inaccurate.

As all these measurements are made without the aid of additional tables, but solely with the rule, the "Logarithmic" is an extremely valuable instrument for the daily use of engineers, mechanics, electricians, etc.

No. 1438. F. P. Co's. **"Logarithmic"** Slide Rule, 10 inches, machine divided on white celluloid facings with adjustment spring and screws, aluminum framed glass indicator, in case with directions.....Each, $6 50

"VICARI'S" SEWER SLIDE RULE



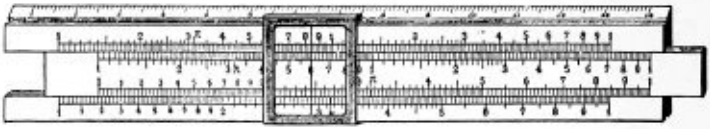
No. 1439.

For direct calculation of circular or egg-shaped sewers at any water level or grade, as well as of waterpipes at any pressure. The result is obtained with one setting without any side calculation whatever.

No. 1439. **"Vicari's"** Sewer Slide Rules, 10 inches, in case with directions. Each.....$5 50

Unless otherwise specified all our slide rules are furnished with glass indicator with one hair line.

A. W. FABER'S SLIDE RULES



No. 1444A.

No. 1440. Faber's Slide Rule for school use, 10¼ inches, selected boxwood, white facing on one side only, no tables on back, in box with book of instructions ..... Each, $3 00

1441. Faber's Slide Rule, boxwood, 10¼ inches, glass indicator in box with book of instructions ..... " 3 50

1442. Same as No. 1441, but with celluloid face ..... " 3 50

1443. Faber's Slide Rule, 5 inches, boxwood, celluloid facing ..... " 3 00

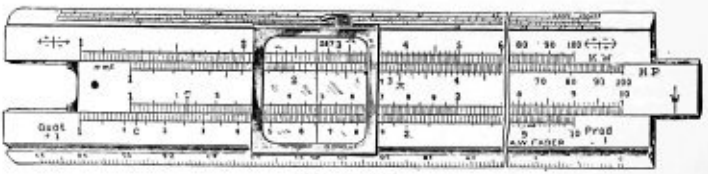
1444. Faber's Slide Rule, 10¼ inches, celluloid facing, glass indicator, with book of instructions ..... " 4 00

No. 1444A. Faber's Improved Slide Rule, 11 inches, boxwood, celluloid facing, without decimals, with self-adjusting slide and registering indicator, in box with directions ..... " 4 50

1444B. Faber's Improved Slide Rule, same as No. 1444A, but 21 inches long ..... " 12 00

Improved Calculating Rule (No. 1444) has a boxwood adjuster inserted into the body of the rule, lateral to the side, which acts upon the side like a spring.

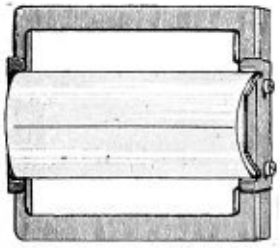
This insures to its movement an even and adequate friction, safeguarding against its becoming excessively tight or loose under changes of temperature or from atmospheric humidity.



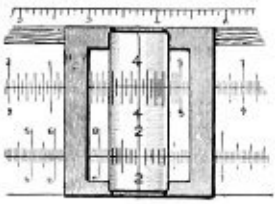
No. 1444C.

No. 1444C. Faber's Improved Slide Rule, 11 inches (Electric), boxwood, celluloid facing, without decimals, with self-adjusting slide and special indicator, in box with instructions ..... Each, $5 00

INDICATORS FOR SLIDE RULES



No. 1445.



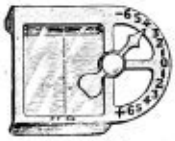
No. 1445, showing on Slide Rule.

No. 1445. Indicator with magnifier for F. P. Co's. Slide Rules ..... Each, $2 00
When ordering please state for what kind of slide rule magnifier is wanted.

No. 1445A.

No. 1445B.

No. 1445A. Extra Glass Indicator, with one hairline ..... Each, $0 50
1445B. Glass Indicator, with two hairlines ..... " 75



No. 1445C.

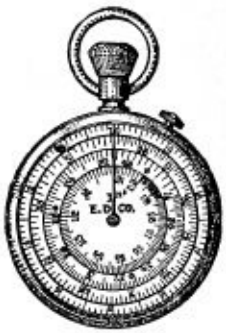
No. 1445C. Glass Indicator with decimal pointer ..... Each, $1 00

LEATHER CASES FOR SLIDE RULES

No. 1445¼. Sole Leather Case for 5 inch slide rule ..... Each, $0 80
1445½. " " " " 10 " " " ..... " 1 00
1445¾. " " " " 15 " " " ..... " 1 50
1445¼. " " " " 20 " " " ..... " 2 00

For Books of Instructions for Slide Rules, see pages 413 to 437

BOUCHER CALCULATOR



No. 1446.

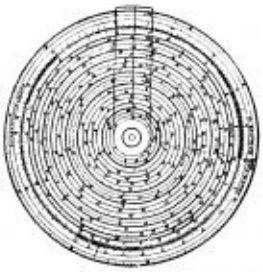
The Boucher Calculator is made in form of a stem winding watch. Compound calculations can be performed easily by means of the two pointers, operated by the "Stemwinder" and acting simultaneously on both dials.

No. 1446. Boucher's Calculator, enameled dial, with directions.....Each, $8 50
1446A. Same as No. 1446, but with silvered dial..... " 14 00

SEXTON'S OMNIMETRE

Functions: Logarithms, Numbers, Squares, Square Roots, Cubes, Cube Roots, Sines Tangents, Versed Sines, Secants.

No 1447. Sexton's Omnimetre No. 1, diam., 7¼ inches, Bristol Board Discs, Readings from edge of runner. Each.....$1 00



No. 1447.

No. 1447A. Sexton's Omnimetre No. 2, diam., 7¼ inches. Non-absorbent Card Discs, Reading from hair-lined runner. Lower disc perforated to facilitate manipulation. Each.....$2 00

No. 1447B. Sexton's Omnimetre No. 3, diam., 7 inches, Non-absorbent Bristol Board Discs, Readings from hair-lined runner. Lower disc perforated to facilitate manipulation. Milled nut to clamp disc in position when required. Character of graduations gives increased ease of reading. Additional functions, fifth powers and fifth roots. Each.....$3 00

No. 1447C. Companion Instrument No. 6, diam., 6¾ inches. This instrument consists of a cardboard disc, a transparent disc, and a transparent runner. Printed upon the card disc is a logarithmic scale about 13½ feet long, arranged in circles. The instrument is intended as a companion to the Omnimetre (although it will answer as a companion to the straight slide rule as well) for those who wish to read accurately at least four figures in the answers to problems of multiplication and division..... Each, $2 00

CIRCULAR SLIDE RULES

THE IMPROVED HALDEN CALCULEX

2¾ inches diameter by ¼ inch thick

No. 1448.

This is the most compact, convenient and most accurate circular slide rule on the market, while at the same time it is the most simple to operate. It is entirely of metal and can therefore neither warp nor shrink. Its construction is extremely simple, so that it is impossible for the instrument to get out of order.

The book of rules accompanying each instrument is the most exhaustive and complete manual ever written, yet it is very clear and easy to understand. It has been arranged so as to fit in a separate compartment of the leather case containing the instrument, so that both together can be carried in the vest pocket without the least inconvenience.

The Calculex, briefly described, consists of a disc within a fixed ring, which together form a dial with logarithmic scales on both sides, surrounded by a metal ring and protected on both sides by a glass rim with an indicator hair line marked thereon.

The instrument is operated by turning the disc, holding the nut on either side between finger and thumb. The outside ring is fastened to the rim.

Logs of numbers, squares, square roots, cubes, cube roots, angles, can be read direct from the indicator line, without turning the disc.

The front face contains five circular of scales. The outer scale No. 1 is a scale of Logs; Nos. 2 and 3 are the calculating scales A and B, Nos. 4 and 5 are the square roots of B scale.

The reverse contains six circles of scales. The outer scale No. 6 is a scale of angles, Nos. 7 and 8 are calculating scales for reverse proportions, Nos. 9, 10, 11 are cube roots of scale B.

No. 1448. Halden Calculex Circular Slide Rule, 2¾ inches diameter by ¼ inch thick, in sole leather case, with manual complete..... Each, $5 00

No. 1449.

CHANDLER'S ADDING AND SUBTRACTING SCALE

Made of celluloid, printed in plain figures. Will fit the vest pocket. Indispensable for professional and business men who wish to save time.

The answers are given in fractions and their decimal equivalents, assuring absolute accuracy.

No. 1449. Chandler's Adding and Subtracting Scale, in leather case with full instructions. . . Each, $1 00

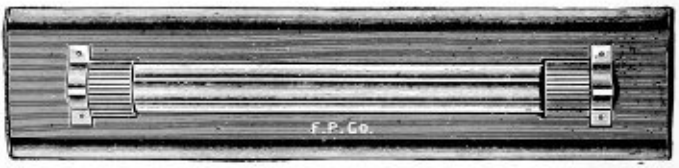
PARALLEL RULES

Nos. 1450–1460.

No. 1450.	Ebony Parallel Rules, brass bars, 6 inches	Each,	$0 35
1451.	" " " " " 9 "	"	60
1452.	" " " " " 12 "	"	75
1453.	" " " " " 15 "	"	90
1454.	" " " " " 18 "	"	1 25
1455.	" " " " " 24 "	"	2 25
1458.	Amber Parallel Rules, nickel-plated bars, 12 inches	"	1 60
1459.	" " " " " 15 "	"	2 00
1460.	" " 18 "	"	2 50

Rubber in place of amber furnished if desired for 25 cents less.

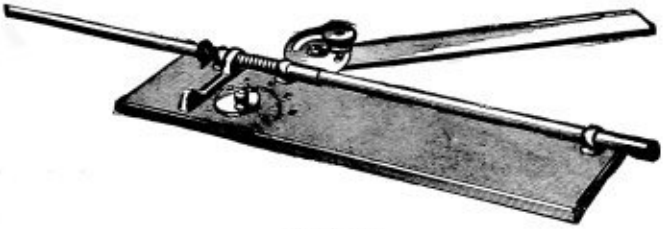
ROLLING PARALLEL RULERS



Nos. 1465–1476.

No. 1465.	Ebony Rolling Parallel Ruler, fine finish, 9 inches	Each,	$ 2 75
1466.	" " " " " " 12 "	"	3 25
1467.	" " " " " " 15 "	"	4 00
1468.	" " " " " " 18 "	"	5 00
1469.	Solid Brass Rolling Parallel Ruler, fine finish, 9 inches	"	7 25
1470.	" " " " " " " 12 "	"	8 50
1471.	" " " " " " " 15 "	"	10 00
1472.	" " " " " " " 18 "	"	12 00
1473.	" " " " " " " 24 "	"	18 00
1474.	Solid German Silver Rolling Parallel Rule, 12 inches	"	10 00
1474½.	" " " " " " 15 "	"	12 00
1475.	" " " " " " 18 "	"	15 00
1476.	" " " " " " 24 "	"	24 00

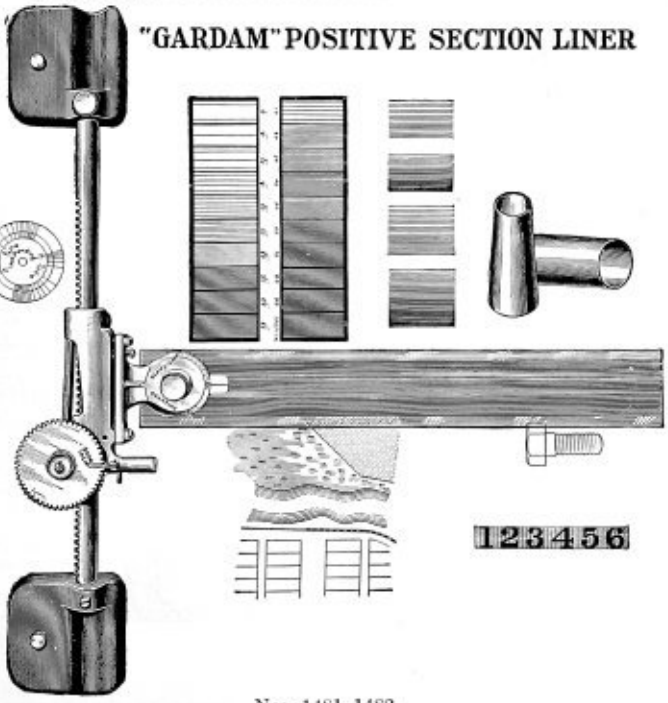
SECTION LINERS



No. 1480.

No. 1480. Section Liner, of Hardwood, with nickel-plated mountings, in case. Each.....$2 00

"GARDAM" POSITIVE SECTION LINER



Nos. 1481–1482.

No. 1481. Section Liner, blade 12 inches long.....Each, $6 50
1482. " " like No. 1481, blade 14 inches long..... " 7 50

Full description furnished with every instrument.

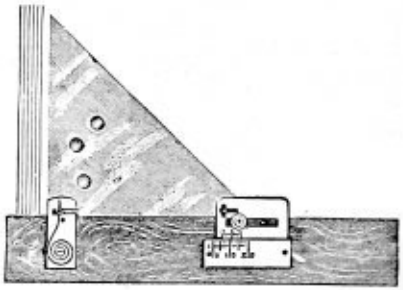
SECTION LINER AND SCALE DIVIDER

No. 1483.

No. 1483. The **"Primo"** Section Liner and Scale Divider, German Silver, base 14½ in., rack 9 in., with arm projecting 10 inches beyond protractor. The protractor is graduated to degrees. In wooden case, with full instructions for use.....Each, $12 00

1484. Section Liner and Scale Divider, like above, but protractor with vernier reading to five minutes.....Each, 13 00

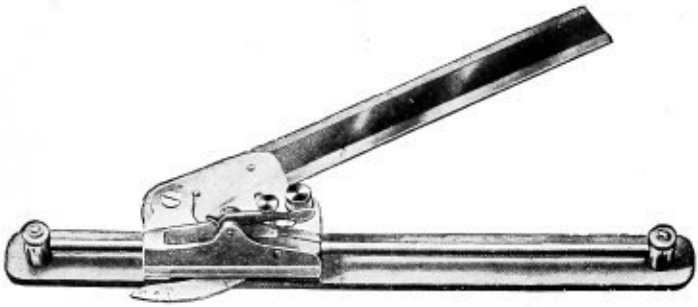
The **"Primo"** Section Liner shown above is simple in construction and therefore easily operated. It is absolutely accurate and of best workmanship. From 4 to 200 parallel lines per inch can be drawn with this instrument and when properly set, inch scales from ⅛ to 3 inches to a foot, and decimals up to 1000 per foot can be made accurately.



No. 1485.

No. 1485. **Patent Section Liner,** triangle of transparent ambro, straight edge of hardwood, German silver mountings; a very reliable and simple instrument, which requires hardly any practice to manipulate it. By the scale and vernier the smallest distances can be regulated....Each, $3 50

THE RUNDLETT SECTION LINER



A Working Drawing in Dress Suit for public appearance, is often required of the draftsman whose usual outfit does not permit results that give due justice to his skill.

The device here described not only makes section lining a rapid and easy operation but a large class of cylindrical and flat shading may be artistically produced by it with great facility.

Its operation, by a slight downward pressure on the head of the adjusting screw, is very simple and positive. It acts through reduced motion and grip block to pull the ruler carriage along, either by uniform or varying steps as desired in response to turning the adjusting screw, and it is not practically affected by wear.

The instrument is made with a mahogany base and plated trimmings, the carriage sliding on a steel rod with adjustable friction.

It is provided with fine needle points projecting from the under surface to locate it on the drawing.

The ruler has transparent celluloid edges about 9 inches long, and may be clamped in any position from 0° to 120°.

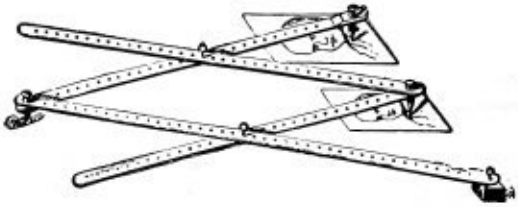
The grip block is released at any point by slight pressure on the curved lever extending from same, when the carriage may be moved to any desired position.

Where any amount of fine section lining or shading is required the use of this instrument will be found to greatly enhance its excellence as well as to relieve the nervous tension involved in it.

No. 1486. **RUNDLETT SECTION LINER** as described above.....Each, $5 00

PANTOGRAPHS

For Enlarging and Reducing Drawings

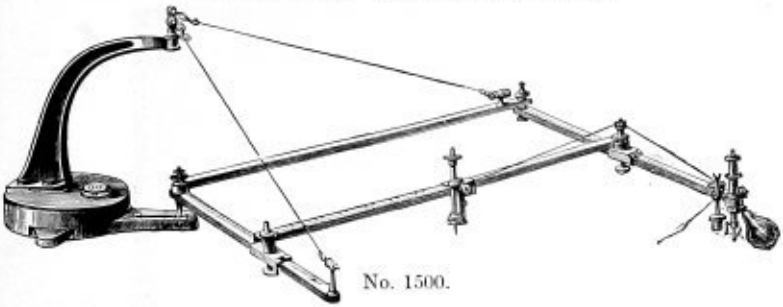


No. 1496.

		Each.
No. 1495.	Is a smaller instrument. It is recommended by teachers as an excellent means of familiarizing children with form and proportion, and greatly assisting them in acquiring a knowledge of the rudiments of drawing by sight from original objects	$0 20
1496.	The best Pantograph for the price. It has very neat and substantial trimmings, clean cut figures, a very neat and satisfactory instrument	50
1497.	Brass mounted, same as No. 1497½ with less adjustments	1 00
1497½.	Brass mounted, same as No. 1498 in every respect, except that it is not polished, in box	1 50
1498.	Brass mounted, with brass ball rest, pencil holder and movable point; polished, black figures, in box	2 00
1498½.	Heavily mounted with nickel plated ball rest, pencil holder and exchangeable point; finely polished black figures, in neat box	2 50
1498A.	Pear Wood, 22-inch arms, in box	4 00
1498B.	Pear Wood, 41-inch arms, in box	5 00

Full directions furnished with each Pantograph

SUSPENDED PANTOGRAPHS

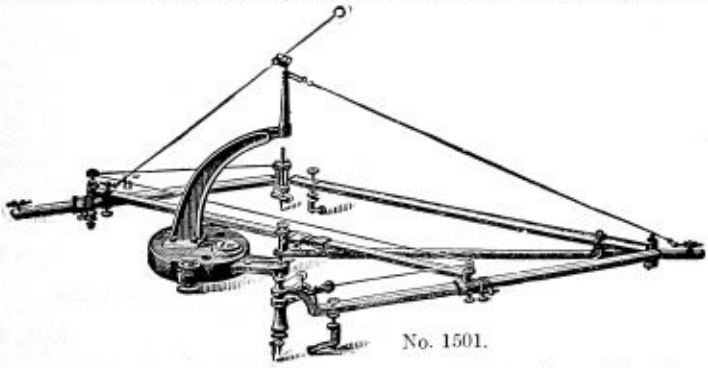


No. 1500.

No. 1499.	Suspended Pantograph, of square wooden bars, 28 inches long, in wooden case	Each,	$36 00
1500.	Suspended Pantograph, of square metal tubes, 33 inches long, divided into mm., enlarging or reducing all proportions from 1-20 to 1-5, in wooden case	"	85 00
1500A.	Same as No. 1500, with arms 37½ inches	"	95 00

SUSPENDED PRECISION PANTOGRAPH

For reducing up to 20:1, enlarging up to 1:20 in all ratios and for reproducing to even scale

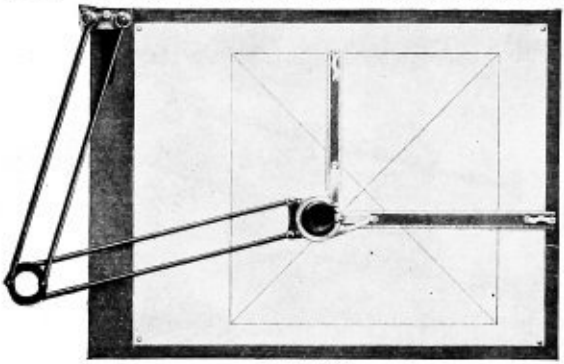


No. 1501.

Suspended Pantograph of square hollow nickeled brass bars. The bars are graduated throughout, divided into millimeters, with verniers reading to 1-10 millimeter and micrometer adjustment on all sliding sockets, with extra supporting bar and appliances for interchanging pole and pencil point to reproduce the original. Convenient controlling arrangement for operating the pencil from the tracing point. Solid iron standard, with 2 spirit levels and two set screws. Instrument complete with adjustable tracing point, 2 steel points, pencil point, with brass weights, extra spirit level and instructions for use, in polished wooden case, lock and handle.

No. 1501.	Suspended Precision Pantograph, with metal bars 33 in. long	Each,	$160 00
1502.	Suspended Precision Pantograph, with metal bars 38 in. long	Each,	170 00

THE "UNIVERSAL" DRAFTING MACHINE.



No. 1504.

This drafting machine consists of a graduated square having an accurate parallel motion about the drawing board. The square is adopted because the work in most drawings consists of sets of lines at right angles. Both blades of the square are graduated for drawing and measuring lines at the same time. The blades of the square chuck into place; interchangeable. Any length and any scale supplied. A straight-edge is provided for inking. It may also be used for long lines. This, however, is not necessary, as lines may be quickly and accurately extended with the square. The parallel motion is obtained by means of two pivoted parallelograms, which constitute an arm joining the square to the board. This arm is made flexible, allowing the blades to lie flat upon the drawing. It is hinged at the connection to the board, and may be easily lifted out of the way of the paper. It may be readily changed from one board to another. The square is moved about the board as easily as though it were not joined to the arm. A conveniently adjusted protractor makes the machine universal. It allows the square to be quickly set at any angle. This makes all angular work just as easy, as rapid, and as accurate as straight work. Spring stops at 30°, 45° and 60° are provided, allowing the square to be instantly set at these frequent angles.

HARDENED JOINT SOLID ROD MACHINES—Without Scales
STANDARD PROTRACTOR

No. 1503. Corner Anchor, sizes 18, 24 or 28 inches.....Each, $25 00
1503A. Mid " " 15, 21, 24 or 28 inches..... " 30 00

BALL BEARING TUBULAR ROD MACHINES—Without Scales
STANDARD PROTRACTOR

No. 1504. Corner Anchor, sizes 18, 24 or 28 inches.....Each, $40 00
1504A. Mid " " 15, 21, 24 or 28 inches..... " 42 50

BOXWOOD SCALES

With white celluloid edges (including chucking plates)

6 inch.....Each, $0 75 18 inch.....Each, $2 25
12 " ..... " 1 25 24 " ..... " 3 00

STRAIGHT EDGES FOR INKING

(Including chucking plates)

12 inch, ebony or maple edge....Each, $0 50; trans. celluloid edges.....Each, $1 00
18 " " " " " " 0 75; " " " " " 1 25
24 " " " " " " 1 00; " " " " " 1 50
36 " " " " " " 1 50; " " " " " 2 25

BOXWOOD AND IVORY PROTRACTORS

No. 1505.

No. 1505. Boxwood Protractor, 6 inches long, 1¾ inches wide, scales of ⅛, ¼, ¾, 1 inch to the foot; scale of chords; diagonal scales.....Each, $0 35

1506. Square Ivory Protractor, 6 inches long, 1¾ inches wide, divided into whole degrees, ¼-, ½-, ¾-, 1-inch scales, scale of chords, diagonal scale, scales of 25, 30, 35, 40, 45 parts per inch.....Each, 1 60

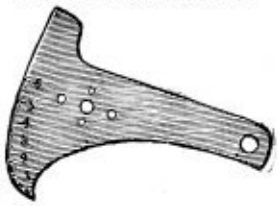
1507. Square Ivory Protractor, 6 inches long, 1¾ inches wide, divided into whole degrees, ⅛-, ¼-, ⅜-, ½-, ⅝-, ¾-, ⅞-, 1-inch scales, scale of chords, diagonal scale, scales of 30, 35, 40, 45, 50, 60 parts per inch...Each, 2 00

1508. Square Ivory Protractor, 6 inches long, 2 inches wide, divided into whole degrees, ⅛-, ¼-, ⅜-, ½-, ⅝-, ¾-, ⅞-, 1-, 1⅛-, 1¼-, 1½-inch scales, scale of chords, diagonal scale, scales of 30, 35, 40, 45, 50, 60 parts per inch.....Each, 4 35

PAPER PROTRACTORS

No. 1509. Circular Protractors, 8 inches diameter, in ¼ degrees, printed on drawing paper, with numbers reading both ways.....Each, $0 20
1510. Same, 14 inches diameter..... " 30
1511. Same as No. 1509, printed on Bristol board, 8 in. diameter... " 20
1512. " " " 1510, " " " " 14 " " ... " 40
1513. " " " " " " Tracing Paper, 8 " " ... " 20
1514. " " " " " " " " 14 " " ... " 30

ODONTOGRAPH

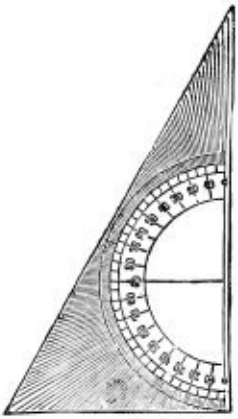


No. 1515.

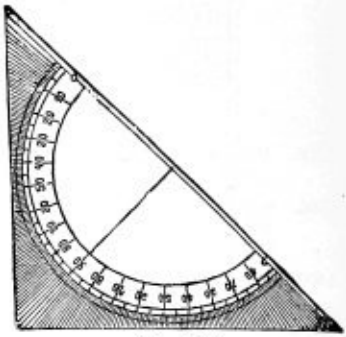
No. 1515. Templet Odontograph, for describing Teeth of Gear Wheels, a valuable instrument for Millwrights, Machinists, Pattern Makers, etc., with full description, in case.....Each, $3 50

TRIANGLE CELLULOID PROTRACTORS

TRANSPARENT



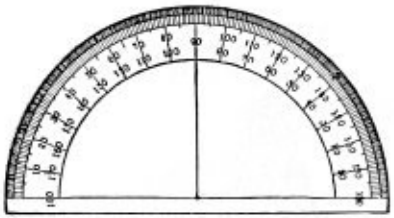
No. 1520.



No. 1523.

			Each
No. 1520.	Triangle Celluloid Protractor,	30°×60°, 5 inch, div. to 1°	$0 45
1521.	" " "	30°×60°, 6 " " 1°	50
1522.	" " "	30°×60°, 7 " " 1°	70
1523.	" " "	45°, 5 " " 1°	50
1524.	" " "	45°, 6 " " 1°	70
1525.	" " "	45°, 7 " " 1°	90

TRANSPARENT CELLULOID PROTRACTORS

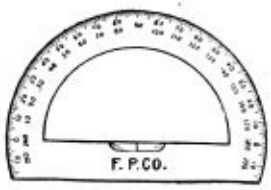


No. 1532.

			Each
No. 1530.	Semicircular Celluloid Protractor,	4 inches diameter, ½°	$0 40
1531.	" " "	5 " " ½°	45
1532.	" " "	6 " " ½°	60
1533.	" " "	7 " " ½°	75
1534.	" " "	8 " " ½°	1 20

TRANSPARENT CELLULOID PROTRACTORS

WITH BEVELED EDGES



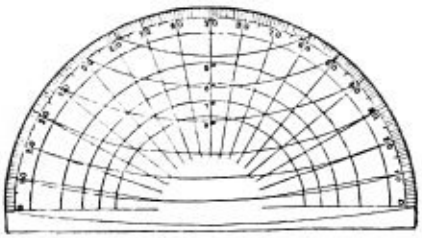
No. 1535-1535A.

Nos. 1535B-1535D.

		Each
No. 1535.	Semicircular Amber Protractor, beveled edge, 6 in., ½°	$2 75
1535A.	" " " " " 8 " ½°	3 50
1535B.	Circular " " " " 6 " ½°	3 50
1535C.	" " " " " 8 " ½°	4 50
1535D.	" " " " " 10 " ½°	5 50

RAILROAD CURVE PROTRACTORS

TRANSPARENT



No. 1536A.

		Each
No. 1536.	Amber Railroad Curve Protractor, 8 in., divided to half degrees, with circular Curves ½°, 1°, 1½°, 2°, 2½°, 3°, 3½°, 4°, 5°, 6°, 7°, 8°, scale 400 feet—1 inch	$2 75
1536A.	Amber Railroad Curve Protractor, 10 in., divided to half degrees, with circular Curves 1°, 1½°, 2°, 2½°, 3°, 3½°, 4°, 5°, 6°, 7°, 8°, 10°, 12°, 14°, 16°, 18°, 20°, scale 100 feet—1 inch	3 25

TRANSPARENT PLOTTING PROTRACTORS

No. 1537.

No. 1537. Transparent Plotting Protractor, with arms 8 inches long.....Each, $1 25

GERMAN SILVER PROTRACTORS

Nos. 1538-1543.

No. 1538.	Semicircular,	4¼	inches diameter,	1	degree	.....	Each,	$0 45
1540.	"	5⅛	" "	½	"	.....	"	70
1541.	"	6¾	" "	½	"	.....	"	80
1542.	"	7½	" "	½	"	.....	"	1 20
1543.	"	8½	" "	½	"	.....	"	1 50

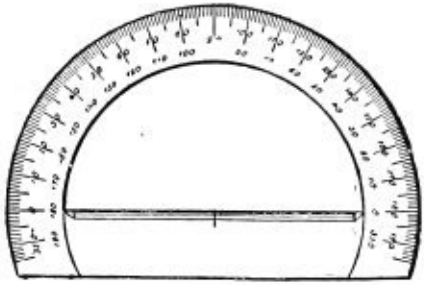
BRASS PROTRACTORS—FINE QUALITY

No. 1544.	Semicircular,	3¾	inches diameter,	1	degree	.....	Each,	$0 20
1545.	"	4¼	" "	1	"	.....	"	25
1546.	"	5⅛	" "	½	"	.....	"	50
1547.	"	6¾	" "	½	"	.....	"	70

METAL SCHOOL PROTRACTORS

No. 1548.	Nickeled, 3		inches diameter, semicircular,		1	degree	.....	Each, $0 05
1549.	Brass	3¾	" "	"	1	"	.....	" 10
1550.	"	3⅜	" "	"	1	"	.....	" 15

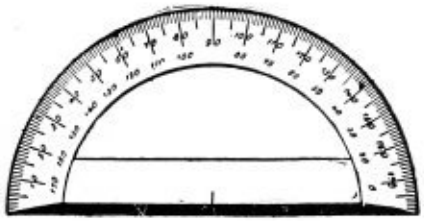
PRIMO METAL PROTRACTORS



No. 1560.

CENTER ON INNER EDGE

No. 1560.	Semicircular,	German Silver,	beveled edge,			1	degree,	4	inch	....	Each,	$1 75
1561.	"	"	"	"	"	½	"	5	"	...	"	2 25
1562.	"	"	"	"	"	½	"	6	"	...	"	2 65
1563.	"	"	"	"	"	¼	"	6	"	...	"	3 25

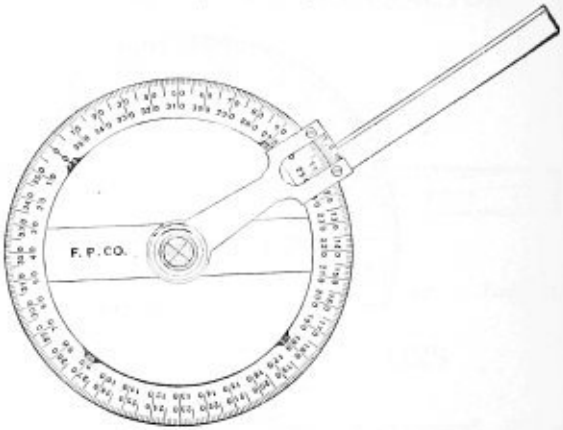


No. 1564.

CENTER ON OUTER EDGE

No. 1564.	Semicircular,	German Silver,	beveled edge,			1	degree,	4	inch	....	Each,	$1 35
1565.	"	"	"	"	"	½	"	5	"	...	"	1 75
1566.	"	"	"	"	"	½	"	6	"	...	"	2 25
1567.	"	"	"	"	"	¼	"	6	"	...	"	3 00
1568.	"	"	"	"	"	½	"	7	"	...	"	3 00
1570.	"	"	"	"	"	½	"	8	"	...	"	3 75

"PRIMO" METAL PROTRACTORS —Continued

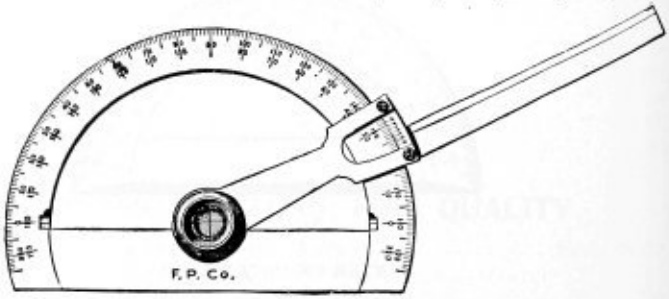


No. 1571.

		Each
No. 1571.	Circular, German Silver, ½°, 5½ in.. Vernier reading to 3 minutes	$15 00
1572.	" " " ¼°, 8 " " " 1 "	17 00
1573.	" " " ¼°, 10 " " " 1 "	21 00

Length of arm beyond edge of Protractors Nos. 1571, 5½ inches; 1572, 6 inches; 1573, 6½ inches.

Morocco Cases, silk velvet lined. Each: 1571, $4.00; 1572, $4.50; 1573, $5.00



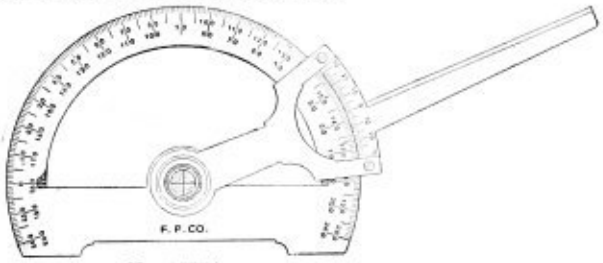
No. 1574.

		Each
No. 1574.	Semicircular, German Silver, ½°, 5½ inch, Vernier reading to 3 min.	$11 00
1575.	" " " ¼°, 8 " " " 1 "	14 50
1576.	" " " ¼°, 10 " " " 1 "	18 00

Length of arm beyond outer edge of Protractors Nos. 1574, 5½ inches; 1575, 6 inches; 1576, 6½ inches.

Morocco Cases, silk velvet lined. Each: 1574, $3.50; 1575, $4.00; 1576, $4.50

"PRIMO" METAL PROTRACTORS —Continued



No. 1577A.

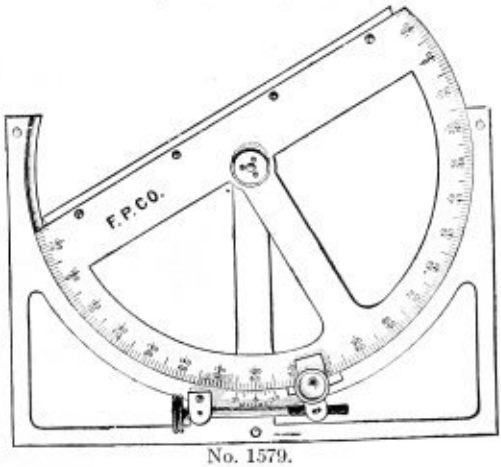
Length of arm beyond outer edge of Protractor: 1577A, 6 in. 1577B, 6½ in.

No. 1577A. Semi-circular German Silver Protractor, 8 inch, with horn centre and movable arm, divided to ½ degrees, vernier reading to 1 minute ..... Each, $15 00

1577B. Semi-circular German Silver Protractor, 10 inch, with horn centre and movable arm, divided to ½ degrees, vernier reading to 1 minute ..... " 18 00

The divisions of protractors 1577A and 1577B are again as open as of those divided to ½ degrees reading to 1 minute. Their verniers are therefore twice as long as those of the latter.

Morocco Case for No. 1577A, each, $4 50; No. 1577B, each, $5 00.

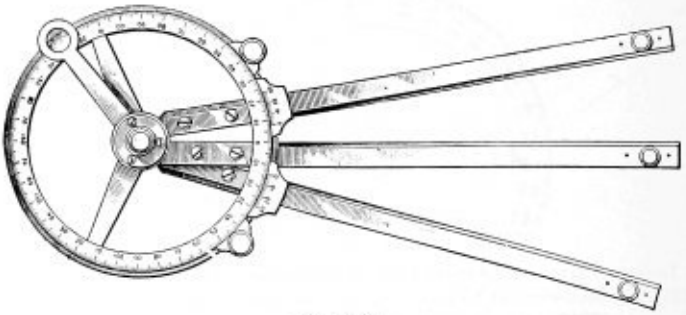


No. 1579.

No. 1579. Crozet Protractor, 8 inch, German Silver, divided to ½ degrees, vernier reading to 1 minute, with tangent screw, in polished mahogany case ..... Each, $40 00

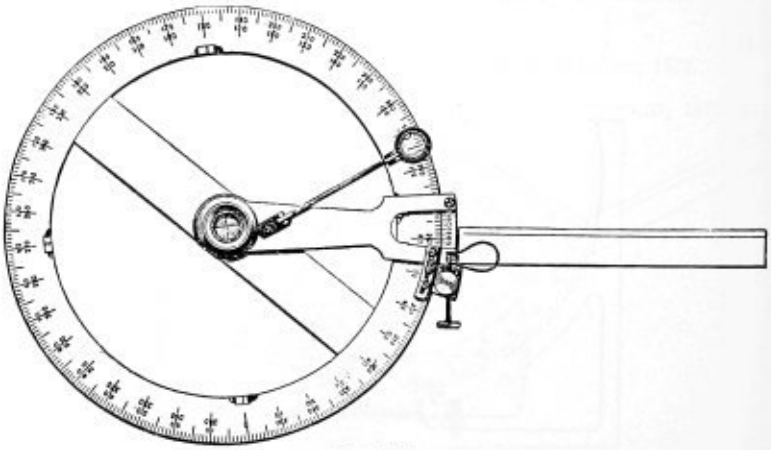
This is a very practical protractor. It is used along a straight edge or T square and angles are set off without bringing the centre over the starting point.

"PRIMO" METAL PROTRACTORS —Continued



No. 1580.

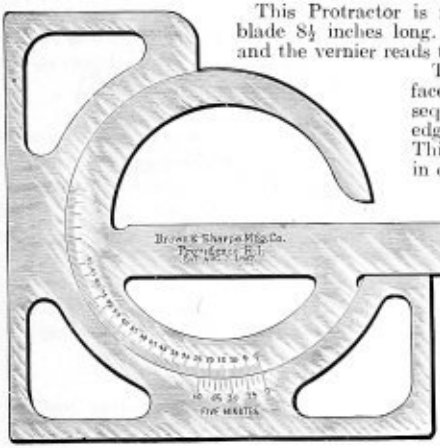
No. 1580. Protractor or Station Pointer, German Silver, three arm, 6½ inches diameter, arms 9 inches long, and extension pieces to lengthen to 17½ inches. Divided ½ degrees, two outer arms with verniers reading to 1 minute, with magnifying lens. In mahogany case. Each, $87 00



No. 1581.

No. 1581. Circular, German Silver, ½ degrees, 8 inches diameter, vernier reading to 1 minute, with clamp screw, micrometer adjustment screw to vernier and magnifying lens..... Each, $23 50
Morocco case, silk velvet lined, for No. 1581..... " 5 00

DRAUGHTSMAN'S PROTRACTOR



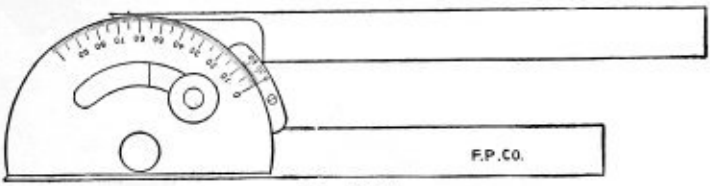
No 1585.

This Protractor is made from sheet steel and has a blade 8½ inches long. The graduations read to degrees and the vernier reads to five minutes.

There are no projections on either face of the Protractor, and consequently it can be used on either edge of the blade or either side up. This makes it particularly convenient in dividing circles, transferring angles, drawing oblique lines at right angles to each other, or laying off given angles each side of a vertical or horizontal line without changing the setting.

No. 1585. Draughtsman's Steel Protractor, with directions.....Each, $6 50
1586. " " " in morocco case..... " 7 75

DRAUGHTSMAN'S STEEL PROTRACTOR



No. 1587A.

No. 1587. Draughtman's German Silver Protractor.....Each, $12 00
1587A. " " " with Vernier reading to 5 minutes " 13 00

This Protractor has blades about 9 inches long. The arc is of 4 in. diameter graduated to degrees, with a vernier reading to 5 minutes. It has a clamping screw which securely holds the blades at any angle and also serves as a knob.

Either blade can be used in contact with T square, giving any angle and its complement from 0° to 90°.

It forms a perfect adjustable triangle and is a well finished and reliable tool of the best workmanship. It has been designed for the draughtman's use and its uses as a protractor are practically unlimited.

POLAR PLANIMETERS

By the aid of these instruments, the Mechanical, Civil, Mining or Marine Engineer can save a great deal of time which would **otherwise** be taken up by laborious computations.

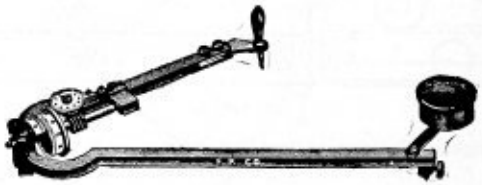
By a simple mechanical operation the planimeter will measure the area of the surface of any drawing or plan drawn to any scale. There are two types of Planimeters, the Polar Planimeter and the Rolling Planimeter. The Polar Planimeter consists of two principal parts, **the pole arm,** at the end of which is the pole around which the instrument revolves and **the tracer arm,** to which the tracing point and the carriage with the recording wheel are attached.

The area of any given figure is measured absolutely accurate by tracing the boundary line with the tracing point, the result is obtained through the reading of the graduated recording wheel.

The operation of the instrument is extremely simple and no other method of mensuration will give as accurate a result.

The scope of the Polar Planimeter is limited by the length of the arms of the instrument, as it revolves around a fixed point. Large plans, therefore, have to be measured in sections.

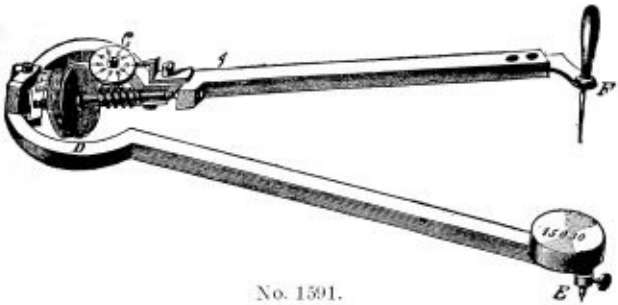
The Rolling Planimeter moves on broad and heavy rollers and is therefore able to measure in one operation plans of any length and of a width equal to the length of the tracer arm.



No. 1590.

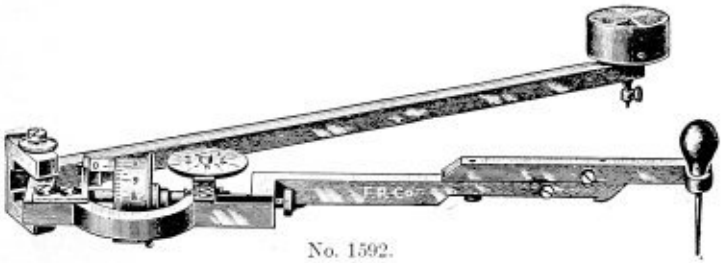
No. 1590. Polar Planimeter, German Silver, with fixed tracer arm and with horizontal disk registering the revolutions of the measuring roller, arranged for measurement of areas in square inches, that is 10, 1, 1-10 and 1-100 square inches, in case.....Each, $15 50

POLAR PLANIMETERS —Continued



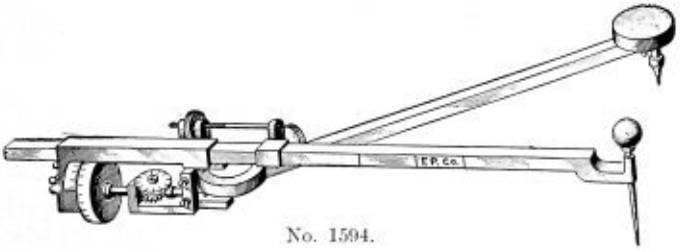
No. 1591.

No. 1591. Polar Planimeter, German Silver, arranged for measurement of areas in square inches; viz., 10, 1, $\frac{1}{10}$, and $\frac{1}{100}$ square inches, with directions, in case ..... Each, $19 00



No. 1592.

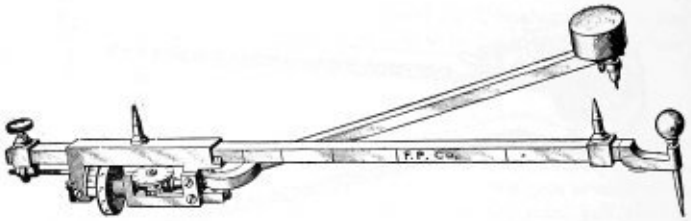
No. 1592. Polar Planimeter, German Silver, for measurements the same as No. 1591, with needle pole; tracer arm so arranged that it can be shortened or made longer, and set in parallel position to axis of roller, with testing rule, in case ..... Each, $21 00



No. 1594.

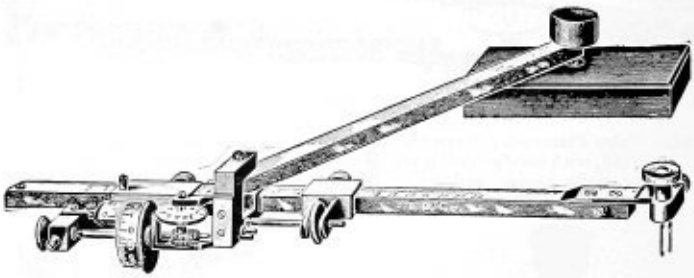
No. 1594. Polar Planimeter, German Silver, for every kind of measurement, with directions, in case ..... Each, $25 00

POLAR PLANIMETERS —Continued



No. 1595.

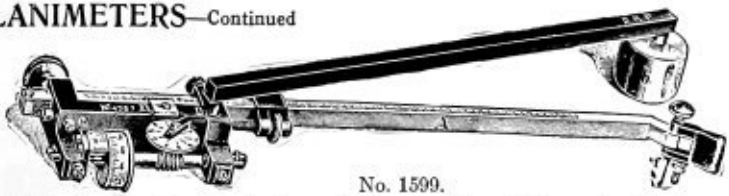
No. 1595. Polar Planimeter, German Silver, for every kind of measurement, with special arrangement for finding rapidly the mean height of indicator diagrams, with directions, in case.....Each, $33 00



No. 1597.

No. 1597. Improved Polar Planimeter, with fully graduated adjustable tracer arm, with vernier reading to 1-20 millimeter easily accessible, set screws and shifting pole weight, ball pole and test plate and table for settings, with special device for rapidly finding the mean height of indicator diagrams, in case.....Each, $35 50

PLANIMETERS—Continued



No. 1599.

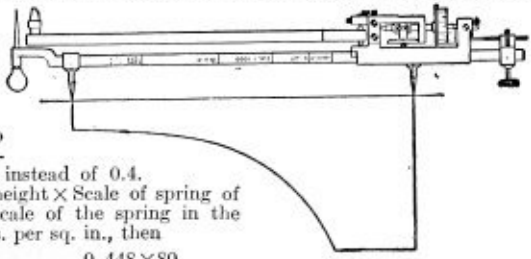
No. 1599. Compensating Planimeter, of German Silver, fully graduated adjustable tracer arm, improved pole-weight with testing rule and table of settings, in morocco case.....Each, $36 00
1600. Same as No. 1599, but with adjustable pole arm..... " 47 00

No. 1599 and No. 1600 are of an entirely novel construction. These instruments consist of two entirely separate parts. Tracer arm with carriage and measuring and recording wheels; pole arm with weight on one end and a steel ball on the other end, forming a ball joint with the wheel carriage when connected. This construction allows the tracer arm to be moved 180° right and left, giving the instrument therefore a very much greater range than the usual planimeters have. By measuring an area with the pole on the right and then again with the pole on the left side of the tracer arm and then taking the mean reading, all instrumental errors are compensated. The tracer arm is provided with a support, which keeps the tracing point just clear of the paper.

In addition to the above, instrument No. 1600 has an adjustable pole arm, bearing index marks for the different settings furnished with the instrument and can be adjusted so that when the instrument is used inside a figure, the constant is a round number, 20,000 for any setting. Large areas can be measured accurately by tracing the figure with the pole on the right and on the left of the tracer arm and taking the mean readings. The instrument can be used on a very small space by reducing the length of the pole and tracer arms. It is used in the same way inside as outside a figure.

DEVICE FOR FINDING THE MEAN HEIGHT OF INDICATOR DIAGRAMS

This device consists of two fine steel points, one attached to the upper side of the tracer arm and the other to the surface of the carriage in which this arm slides. To find the mean height of indicator diagram take, by shifting the slide on the bar and keeping the planimeter upside down, the diagram lengthwise between the steel points on the upper side of the instrument as shown in the adjoining figure. Then place the planimeter without altering the relative position of slide and bar in the usual way upon the drawing—needle point outside the diagram—and follow the outline of the diagram with the tracing point. The difference of the readings at the beginning and at the end of the operation divided by 0.4 is then the mean height of hte diagram, expressed in inches.



Example:

Second reading... 2.361
First reading..... — 1.913

0.4) 0.448

=1.12 ins.=mean height.

If the diagrams for up and down stroke are measured jointly, divide by 0.8 instead of 0.4.

Mean pressure=Mean height × Scale of spring of indicator. Supposing the scale of the spring in the above example is 1"=80 lbs. per sq. in., then

$$\text{Mean pressure} = \frac{0.448 \times 80}{0.4} = 89.6 \text{ lbs. per sq. in.}$$

The number of lbs. per inch of height being usually a multiple of 4, the arithmetical work is thus extremely simple.

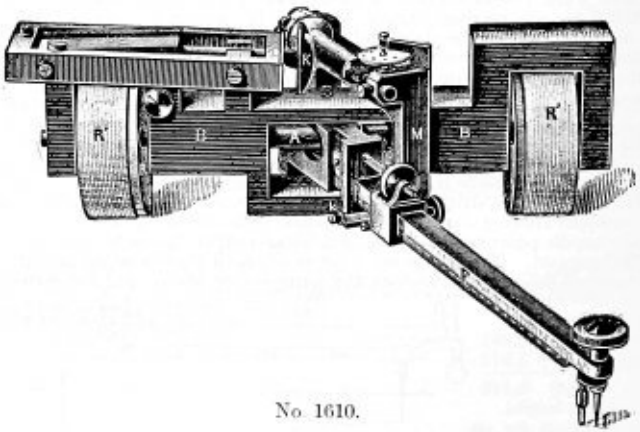
PLANIMETERS —Continued

No. 1605.

No. 1605. Precision Suspended Disc Planimeter, German silver and brass adjustable tracer arm, graduated to 1-2 millimeters with vernier reading to 1-20 millimeter, with testing rule and table of settings in leather case, with instructions.....Each, $85 00

The construction of this instrument makes the motion of the measuring wheel independent of the condition of the paper of the drawing, the measuring wheel revolving on the disc. Plans which have been folded or rolled can therefore be conveniently and accurately measured with this instrument.

ROLLING PLANIMETERS



No. 1610.

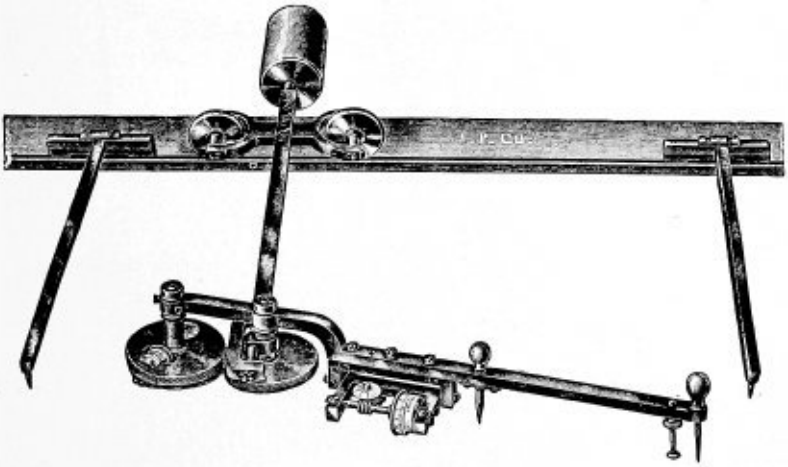
No. 1610. Rolling Planimeter, German silver and brass, adjustable, fully graduated, tracer arm 11 inches long with 8-inch telescoping extension piece, with testing rule and table of settings, in morocco case, with instructions.....Each, $95 00

The area of a figure, which can be measured with this instrument in one operation, is unlimited in length, but must not be wider than the extended tracer arm is long. The condition of the paper does not affect the accuracy of the results, as only the roller and the tracer come in contact with the paper.

MECHANICAL INTEGRATORS AND INTEGRAPHS

Integrators are used for measuring areas and moments relative to any axis of any figure by tracing its outline. They are an invaluable aid in naval architecture for finding the displacements, centers of gravity, moments of stability and inertia, etc., of vessels, also for figuring the strength of beams or girders, cables, etc., etc. The readings on the integrator are taken from discs, computed, and the curves constructed by means of the computed points.

The integraph gives at once a graphical representation by drawing the ingral curves directly on the paper, which makes this instrument invaluable to ship or bridge builders.



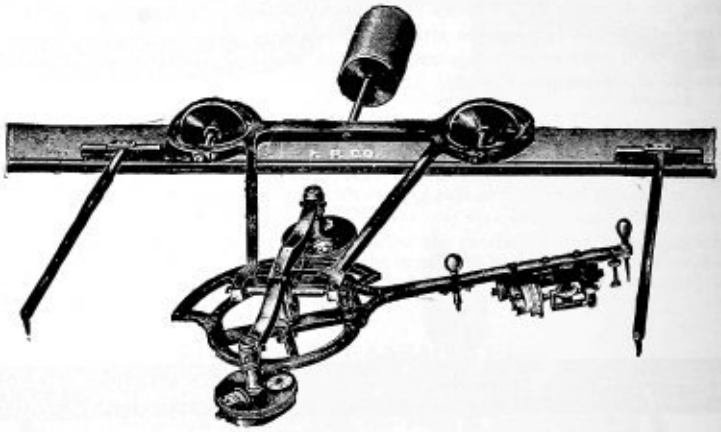
No. 1612.

No. 1612. **Mechanical Integrator,** German Silver, with **two recording mechanisms,** giving the area and moment of any figure; two tracing points, grooved steel straight edge, 29 inches long, in case, with directions ..... Each, $115 00

No. 1615. **Mechanical Integrator,** like No. 1612 but made of brass ..... Each, 90 00

Range of the above instruments—Longitudinal, 26 inches; Transverse, 15 inches.

MECHANICAL INTEGRATOR



No. 1620. **Mechanical Integrator,** German Silver, with **three recording mechanisms,** giving the **area, moment** and **moment of inertia** of any figure; two tracing points, two gauges for adjusting instrument to axis of moments, instrument in case; grooved steel rail, 59 inches, in separate hardwood case, with directions ..... Each, $175 00

1625. Same as No. 1620, but made of brass ..... " 150 00

Dimensions:

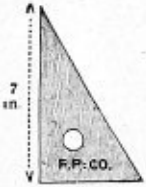
Longitudinal range	50 inches.
Transverse range	13 "
Length of rail	59 "
Distance from rail to axis of moments	7.5 "

Brass Integrators are imported to order only

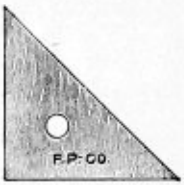
STOCK ROOM, FACTORY.

WOODEN TRIANGLES

GOOD WORKMANSHIP WELL-SEASONED MATERIAL



No. 1700.



No. 1701.

No. 1710.

No. 1711.

No. 1700. **Cherry Triangles,** solid, 30×60 degrees.

Size in inches	7	9
Each	$0 08	10

1701. **Cherry Triangles,** solid, 45 degrees.

Size in inches	5⅛	7⅛
Each	$0 08	10

1702. **Cherry Triangles,** framed, mortised joints, 30×60 degrees.

Size in inches.	6	7	8	9	10	11	12	14
Each	$0 10	11	12	15	16	18	20	24

1703. **Cherry Triangles,** framed, mortised joints, 45 degrees.

Size in inches	5	6	7	8	9	10	12
Each	$0 10	12	15	16	18	20	24

1710. **Pearwood Triangles,** plain, 30×60 degrees.

Size in inches	6	7	8	9	10	12	14
Each	$0 15	16	18	22	25	30	40

1711. **Pearwood Triangles,** plain, 45 degrees.

Sizes in inches	5	6	7	8	9	10	12
Each	$0 15	18	20	25	27	30	35

1712. **Pearwood Triangles,** dull polish, 30×60 degrees.

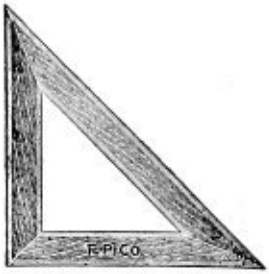
Sizes in inches	6	7	8	9	10	11	12	14
Each	$0 25	30	35	40	45	50	60	75

1713. **Pearwood Triangles,** dull polish, 45 degrees.

Sizes, in inches	5	6	7	8	9	10	12
Each	$0 25	30	35	40	45	60	75

WOODEN TRIANGLES —Continued

No. 1715



No. 1716.

No. 1715. **Ash, Maple-lined Triangles,** mortised joints, 30×60 degrees.

Size in inches	6	8	10	12	14	16
Each	$0 22	25	30	40	50	75

1716. **Ash, Maple-lined Triangles,** mortised joints, 45 degrees.

Size in inches	6	8	10	12	14
Each	$0 25	30	40	50	75

1718. **Pearwood Triangles,** Maple-lined, plain, 30×60 degrees.

Size in inches	6	7	8	9	10	11	12	14
Each	$0 20	25	28	30	35	40	45	50

1719. **Pearwood Triangles,** Maple-lined, plain, 45 degrees.

Size in inches	5	6	7	8	9	10	12	14
Each	$0 25	28	30	35	40	45	50	75

No. 1720.

No. 1721.

No. 1720. **Mahogany, Ebony-lined Triangles,** mortised joints, 30×60 degrees.

Size in inches	8	10	12	14	16	18	20
Each	$0 35	40	55	75	1 00	1 25	1 50

1721. **Mahogany, Ebony-lined Triangles,** mortised joints, 45 degrees.

Size in inches	6	8	10	12	14	16
Each	$0 35	40	55	75	1 25	1 50

1722. **Pearwood Triangles,** Ebony-lined, dull polished, 30×60 degrees.

Size in inches	6	8	10	12	14
Each	$0 30	35	40	55	75

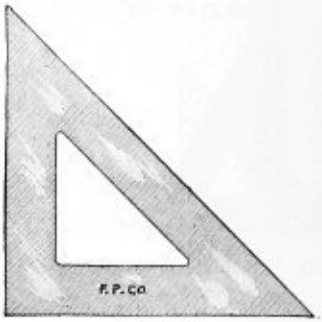
1723. **Pearwood Triangles,** Ebony-lined, dull polished, 45 degrees.

Size in inches	5	6	8	10	12
Each	$0 30	35	45	50	75

TRANSPARENT AMBER TRIANGLES

REGULAR STYLE

No. 1747.



No. 1748.

No. 1747. Transparent Amber Triangles, 30×60 degrees.

Size in inches	4	5	6	7	8	9	10	11	12	14	16	18
Each	$0 20	30	35	40	50	60	70	80	90	1 50	2 30	3 25

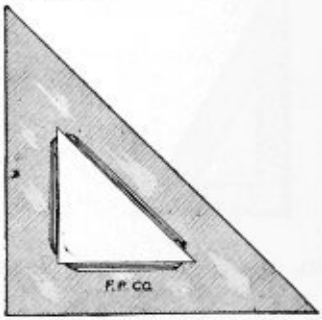
1748. Transparent Amber Triangles, 45 degrees.

Size in inches	3	4	5	6	7	8	9	10	12	14	16
Each	$0 25	30	40	50	60	70	85	1 00	1 50	2 00	3 00

IMPROVED STYLE

With Bevels on Inner Edges

No. 1747B.



No. 1748B.

No. 1747B. Transparent Amber Triangles, beveled on inner edges, 30×60 degrees.

Size, in.	4	5	6	7	8	9	10	11	12	14	16	18
Each	$0 25	35	40	45	55	65	75	85	1 00	1 65	2 50	3 50

1748B. Transparent Amber Triangles, beveled on inner edges, 45 degrees.

Size in inches	3	4	5	6	7	8	9	10	12	14	16
Each	$0 30	35	45	55	65	75	95	1 10	1 65	2 20	3 15

BLACK AMBER TRIANGLES

No. 1749A.

No. 1749B.

No. 1749A. Black Amber Triangles, Open Center, 30×60 degrees.

Size in inches	4	5	6	7	8	9	10	11	12	14	16
Each	$0 15	20	25	30	35	40	45	50	60	1 00	1 50

1749B. Black Amber Triangles, Open Center, 45×45 degrees.

Size, inches	3	4	5	6	7	8	9	10	11	12	14	16
Each	$0 15	25	30	35	40	45	55	60	75	1 00	1 50	2 20

STEEL TRIANGLES

No. 1750A.

No. 1750B.

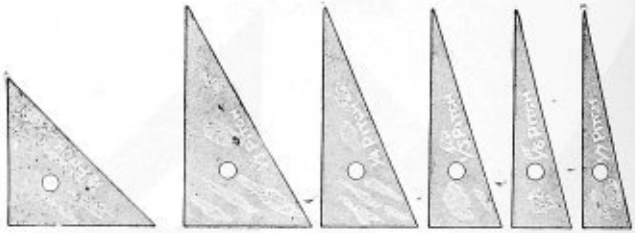
No. 1750A. Steel Triangles, nickel-plated, 30×60 degrees.

Size in inches	6	7	8	11	15
Each	$3 25	3 50	3 75	4 25	6 50

1750B. Steel Triangles, nickel-plated, 45 degrees.

Size in inches	5	6	8	10	12
Each	$3 25	3 50	4 25	5 60	6 60

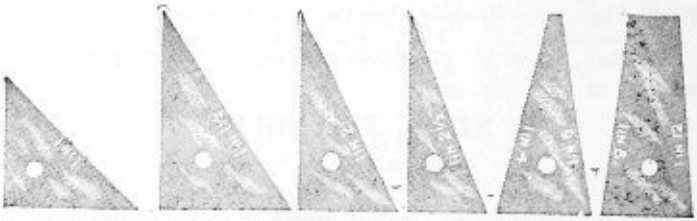
TRIANGLES FOR ROOF PITCHES



No. 1751.

No. 1751. Transparent Amber Triangles for Roof Pitches.....Per set of 6, $2 80

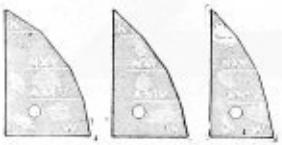
TRANSPARENT AMBER TRIANGLES FOR EMBANKMENTS



No. 1752.

No. 1752. Transparent Amber Triangles for Embankments, 8 slopes, 6 templets.....Per set, $4 75

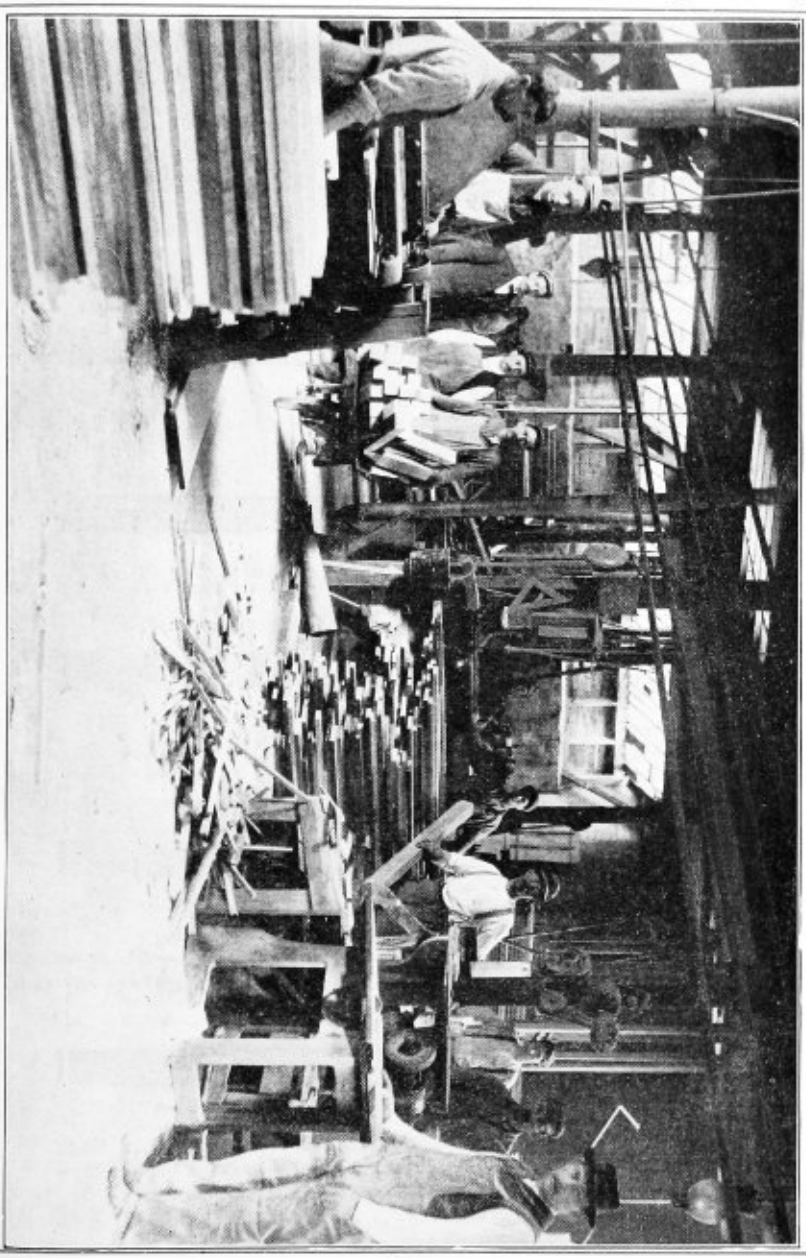
LETTERING ANGLES



No. 1754.

No. 1755.

No. 1753. Hard Rubber Lettering Angles, 3½ inches, 3 in set.....Per set, $1 20
1754. Transparent Celluloid Lettering Angles, 3½ inches, 3 in set...Per set, 1 50
1755. Transparent Celluloid Lettering Angles, 3 in set.....Per set, 1 80



HEAVY WOOD WORKING DEPARTMENT, FACTORY

STRAIGHT EDGES

No. 1800. Cherry, one edge beveled

Inches	18	24	30	36	42
Each	$0 20	25	30	40	50

No. 1801. Ash, hardwood-lined.

Inches	24	30	36	42	48	54	60	72
One edge beveled.... Each,	$0 35	45	60	75	1 00	1 20	1 50	2 00

No. 1802. Mahogany, Ebony-lined

Inches	24	30	36	42	48	54
One edge beveled. Each,	$0 50	60	80	1 00	1 35	1 60

No. 1804. Transparent Amber, lined, square edges.

Size in inches	18	24	30	36	42	48
Each	$0 75	1 00	1 25	1 50	1 80	2 20

No. 1807. Steel Straight Edges, nickel-plated, one edge beveled.

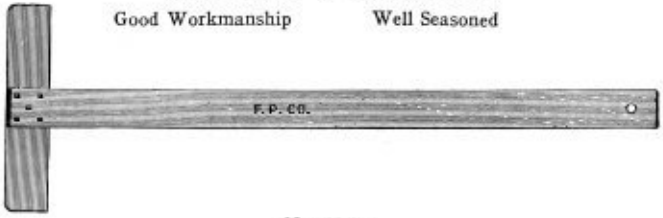
Size in inches	15	18	24	30	36	42	48	60	72
Width, "	1¼	1¼	1½	1¾	2	2¼	2½	2¾	3
Each	$1 75	2 00	3 00	4 00	5 00	6 50	8 00	11 00	15 00

No. 1808. Steel Straight Edges, nickel-plated, square edges.

Size in inches	15	18	24	30	36	42	48	60	72
Width, "	1¼	1¼	1½	1¾	2	2¼	2½	2¾	3
Each	$1 25	1 50	2 00	3 00	4 00	5 00	6 00	8 50	12 00

WOODEN T SQUARES

Good Workmanship Well Seasoned



No. 1820.

No. 1820. Cherry Blade, fixed head.

Size in inches	15	18	21	24	30	36	42	48	54	60
Each	$0 15	20	22	25	30	40	45	65	75	1 00

No. 1822.

No. 1822. Cherry Blade, shifting double head.

Size, in inches	15	18	21	24	30	36	42	48	54	60
Each	$0 50	60	65	70	80	90	1 00	1 20	1 50	1 75

No. 1823.

No. 1823. Pearwood, fixed head, plain.

Size in inches	15	18	21	24	30	36	42	48	54
Each	$0 25	28	30	35	45	55	65	90	1 10

1824. Pearwood, fixed head, dull polished.

Size in inches	15	18	21	24	30	36	42	48	54
Each	$0 30	35	40	45	60	70	85	1 20	1 50

1825. Pearwood, shifting double head, plain.

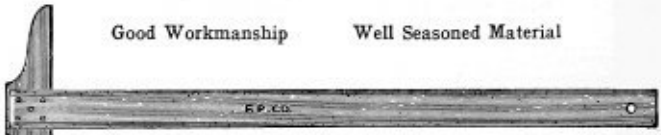
Size in inches	15	18	21	24	30	36	42	48	54
Each	$0 70	75	80	90	1 00	1 15	1 25	1 50	2 00

1826. Pearwood, shifting double head, dull polished.

Size in inches	15	18	21	24	30	36	42	48	54
Each	$0 90	1 00	1 10	1 25	1 35	1 50	1 75	2 00	3 00

WOODEN T SQUARES —Continued

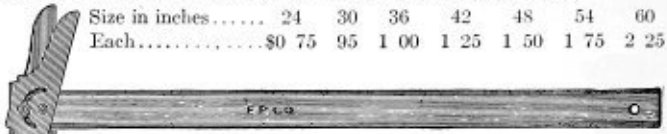
Good Workmanship Well Seasoned Material



No. 1827.

No. 1827. Hardwood-lined Blade, Black Walnut fixed head, polished.

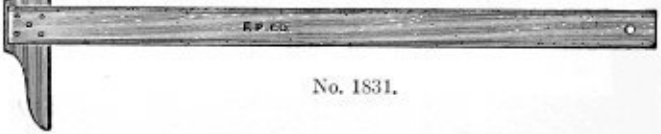
Size in inches	24	30	36	42	48	54	60	72
Each	$0 75	95	1 00	1 25	1 50	1 75	2 25	3 00



No. 1829.

No. 1829. Hardwood-lined Blade, double shifting Walnut head, with two nickel-plated swivels, polished.

Size in inches	24	30	36	42	48	54	60	72
Each	$1 35	1 50	1 65	1 85	2 15	2 50	3 00	4 00



No. 1831.

No. 1831. Pearwood, Maple-lined Blade, fixed head, polished.

Size in inches	24	30	36	42	48	54
Each	$0 80	95	1 10	1 25	1 50	1 80

1832. Pearwood, Ebony-lined Blade, fixed head, polished.

Size in inches	24	30	36	42	48	54
Each	$0 80	95	1 10	1 25	1 50	1 80

1833. Pearwood, Maple-lined Blade, double shifting head.

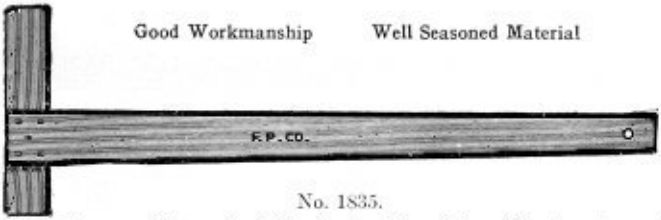
Size in inches	24	30	36	42	48	54
Each	$1 40	1 50	1 65	1 90	2 20	2 60

1834. Pearwood, Ebony-lined Blade, double shifting head.

Size in inches	24	30	36	42	48	54
Each	$1 50	1 60	1 75	2 00	2 25	2 75

WOODEN T SQUARES —Continued

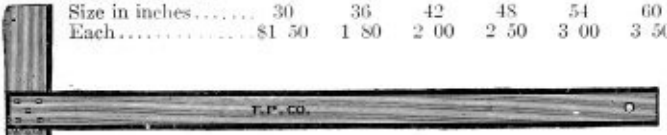
Good Workmanship Well Seasoned Material



No. 1835.

No. 1835. Mahogany, Ebony-lined Blade, fixed head, beveled edge, tapered blade, highly polished.

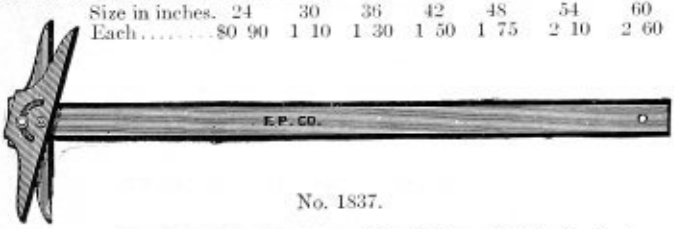
Size in inches	30	36	42	48	54	60	72
Each	$1 50	1 80	2 00	2 50	3 00	3 50	4 50



No. 1836.

No. 1836. Mahogany, Ebony-lined Blade, fixed head, shellac finish.

Size in inches.	24	30	36	42	48	54	60	72
Each	$0 90	1 10	1 30	1 50	1 75	2 10	2 60	3 00



No. 1837.

No. 1837. Mahogany, Ebony-lined Blade, with shifting double head, two nickel-plated swivels, shellac finish.

Size in inches.	24	30	36	42	48	54	60	72
Each	$1 70	1 95	2 20	2 45	2 75	3 20	3 85	4 25

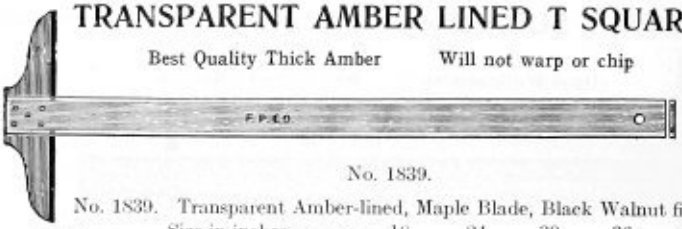
No. 1838.

No. 1838. Mahogany, Ebony-lined Blade, movable head, with patent clamping swivel and micrometer adjustment, shellac finish.

Size in inches	24	30	36	42	48	54	60
Each	$2 60	2 70	3 00	3 25	3 50	4 00	4 50

TRANSPARENT AMBER LINED T SQUARES

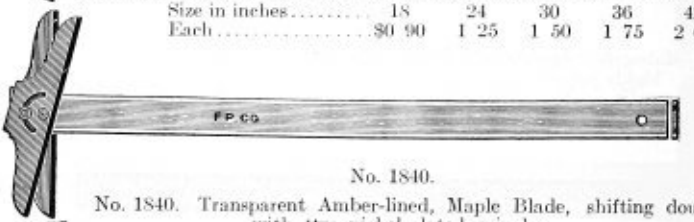
Best Quality Thick Amber Will not warp or chip



No. 1839.

No. 1839. Transparent Amber-lined, Maple Blade, Black Walnut fixed head.

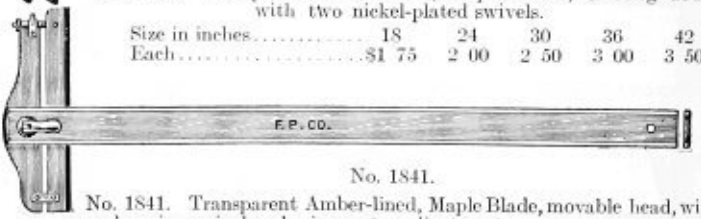
Size in inches	18	24	30	36	42	48
Each	$0 90	1 25	1 50	1 75	2 00	2 50



No. 1840.

No. 1840. Transparent Amber-lined, Maple Blade, shifting double head, with two nickel-plated swivels.

Size in inches	18	24	30	36	42	48
Each	$1 75	2 00	2 50	3 00	3 50	4 00



No. 1841.

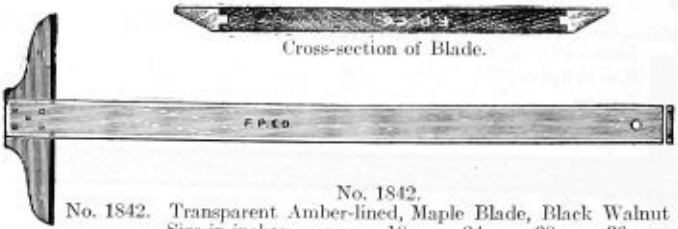
No. 1841. Transparent Amber-lined, Maple Blade, movable head, with patent clamping swivel and micrometer adjustment.

Size in inches	24	30	36	42	48
Each	$3 25	3 50	3 90	4 40	5 00

WITH BEVELED LOWER EDGES GROOVED

(Patented)

Cross-section of Blade.



No. 1842.

No. 1842. Transparent Amber-lined, Maple Blade, Black Walnut fixed head.

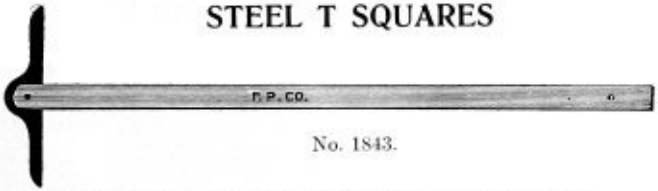
Size in inches	18	24	30	36	42	48
Each	$1 20	1 50	2 00	2 50	3 00	3 50

No. 1842½. Same as No. 1842, but with movable head.

Size in inches	18	24	30	36	42	48
Each	$2 00	2 50	3 00	3 50	3 75	4 25

By this arrangement the edge of the T square does not come into contact with the drawing. It is therefore impossible to smear the ink. (See cross-section of blade above).

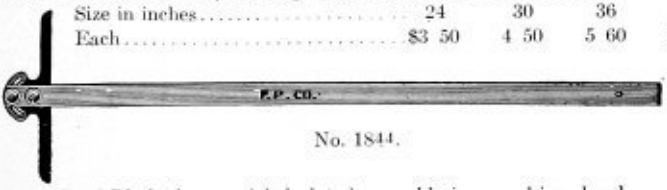
STEEL T SQUARES



No. 1843.

No. 1843. Steel Blade, heavy-nickel plated, fixed japanned iron head.

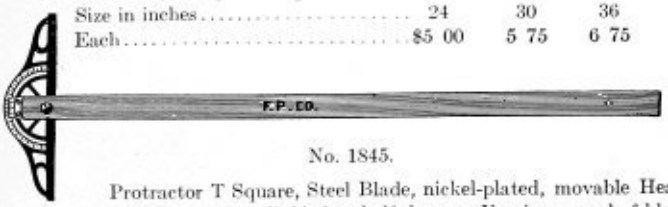
Size in inches	24	30	36	42
Each	$3 50	4 50	5 60	6 60



No. 1844.

No. 1844. Steel Blade, heavy nickel-plated, movable japanned iron head.

Size in inches	24	30	36	42
Each	$5 00	5 75	6 75	7 75



No. 1845.

Protractor T Square, Steel Blade, nickel-plated, movable Head, with Protractor divided to half degrees, Vernier on end of blade reading to minutes.

No. 1845. Size in inches	24	30	36	42 in.
Width in inches	1¼	1½	1½	1¾
Each	$8 50	9 50	10 50	11 50

ENGRAVERS' T SQUARES

No. 1846.

No. 1847.

No. 1846. Engravers' T Square, Steel Blade, fixed head.

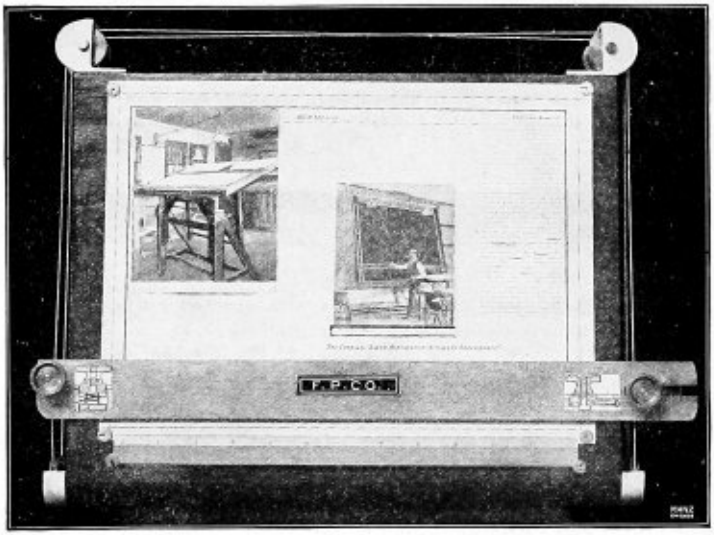
Size in inches	6	8	10	12
Each	$1 25	1 50	2 00	2 50

1847. Engravers' T Square, Steel Blade, movable head, with swivel.

Size in inches	6	8	10	12
Each	$1 50	1 75	2 25	2 75

PARALLEL RULER ATTACHMENT

For use on Drawing Frames, Drawing Boards and the Blackboard.



No. 1850.

Our attachments are of brass, highly polished, easily taken apart for cleaning and oiling.

Operates easily at any angle of board or table, carrying the ruler blade with a light touch of the fingers of either hand, enabling the draughtsman to carry the scale for measurements in the left hand, a practice not convenient with the T square method, and by which increased rapidity is obtained.

Used in connection with the tilting table, it allows the draughtsman to assume a more healthy and pleasant attitude at his work.

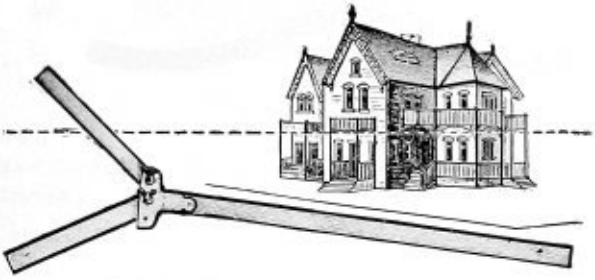
The attachments can be readily attached to the drawing boards now in use, utilizing the straight edges, as listed on page 123.

No. 1850. Parallel Ruler Attachment, for drawing boards, 24 inches to 60 inches long, complete ..... Each, $5 00

Full directions with each outfit.

For Drawing Boards, see pages 248-249

PERSPECTIVE LINEADS



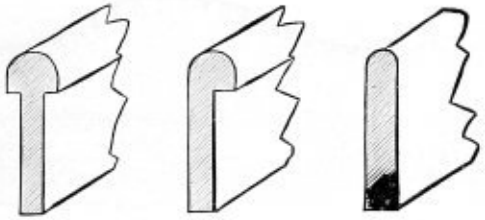
No. 1852.

No. 1851. Perspective Linead or Centrolinead, mahogany, ebony-lined, nickel-plated swivels, with two studs, blade 24 inches, arms 10 inches. ..... Each, $3 00

1852. Same as No. 1851, with blade 30 inches, arms 11 inches ..... " 3 50

1855. " " 1851, " " 36 " " 12 " ..... " 4 00

BARS FOR BEAM COMPASSES



No. 1858. Style No. 1. No. 2. No. 3.

Bars for Beam Compasses made of hardwood.

1858. Style No. 1, 2 or 3.

Size in inches	24	30	36	42	48	60
Each	$0 25	30	35	40	50	65

ADJUSTABLE CURVE RULERS

Nos. 1860–1861.

No. 1860. Adjustable Curve Ruler, Double Edge, 7 inches long..... Each, $0 42
1861. " " " " " 15 " " ..... " 87
1862. " " " " " 31 " " ..... " 1 70

No. 1863.

No. 1863. Adjustable Curve Ruler, 12 inches long..... Each, $1 00
1864. " " " 24 " " ..... " 1 75

No. 1865.

No. 1865. Adjustable Curve Ruler, 14½ inches long..... Each, $2 25

No. 1866.

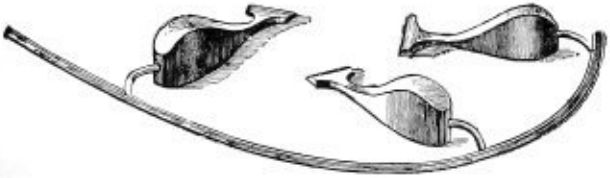
No. 1866. Adjustable Curve Ruler, 30 inches long..... Each, $3 30

SPLINES

No. 1870.

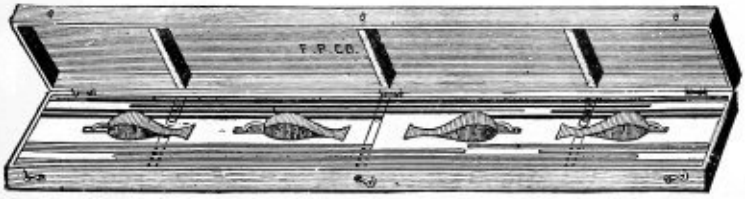
		Inches,	18	24	30	36	42	48	60
No. 1870.	Wood	Each,	$0 15	20	25	30	35	40	50
1872.	Hard Rubber	"	25	30	40	45	50	55	..
1873.	Transparent Amber	"	.....	40	45	50	55	60	..

WEIGHTS FOR SPLINES



No. 1874.

No. 1874. Lead Weights for Splines, with hook ..... Each, $0 80



No. 1875.

No. 1875. Set of Splines and Spline Weights, containing:

4 Spline Weights, No. 1874.
1 each Pearwood Splines, No. 1870—18, 24, 30, 36, 42, 48 inches.
" Transparent Amber Splines, No. 1873—18, 24, 30, 36, 42 inches

In wooden box ..... Per set, $10 00

PEARWOOD AND RUBBER CURVES

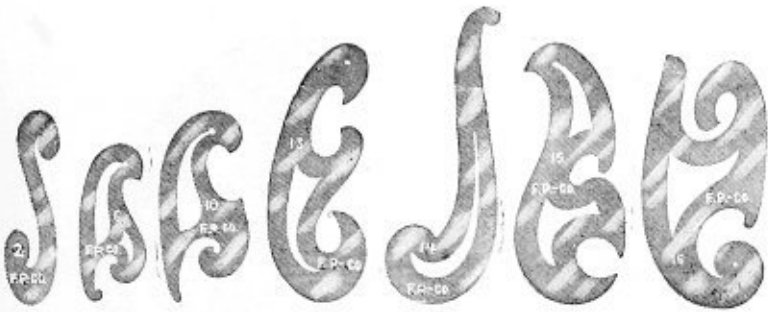
2 6 10 13 14 15 16

			2	6	10	13	14	15	16
No. 1880.	Pearwood.....	Each, $0	15	15	20	25	25	25	25
1882.	Hard Rubber.....	"	30	30	40	40	45	45	45

19 21 23 24 25

			19	21	23	24	25
No. 1880.	Pearwood.....	Each, $0	30	35	35	35	40
1882.	Hard Rubber.....	"	60	60	70	80	1 00

TRANSPARENT AMBER CURVES



2 6 10 13 14 15 16

No.	2	6	10	13	14	15	16
No. 1884. Transparent Amber.. Each,	$0 45	45	50	60	60	60	60

19 21 23 24 25

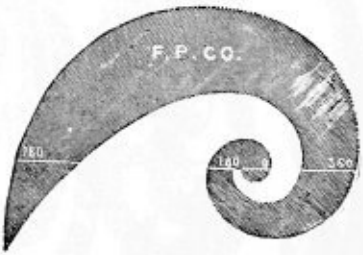
No.	19	21	23	24	25
No. 1884. Transparent Amber..... Each,	$0 90	90	1 00	1 00	1 50

TRANSPARENT AMBER CURVES

No. 1886.

No. 1888.

No. 1886. Combination Curve of Transparent Amber.....Each, $1 00
1888. " " " " ..... " 1 80

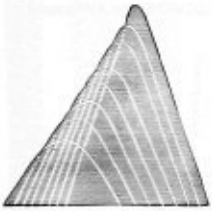


No. 1890.

No. 1890. Spiral Logarithmic Curve of Transparent Amber .....Each, $1 75

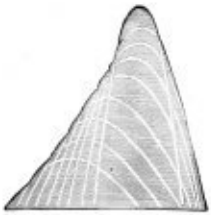
This curve contains every curve, limited only by its size, and can be used for intricate calculations.

HYPERBOLAS, ELLIPSES AND PARABOLAS



No. 1891.

No. 1892.



No. 1894.

						Transparent Amber
No. 1891.	Hyperbolas,	8	to set, 2	to 5½	inches ..... Per set,	$3 50
1892.	Ellipses,	6	" 2	" 4½	" ..... "	2 50
1983.	"	10	" 1½	" 6	" ..... "	4 00
1894.	Parabolas,	8	" 1½	" 5½	" ..... "	3 50
1895.	"	8	" 3¼	" 14¼	" ..... "	8 00

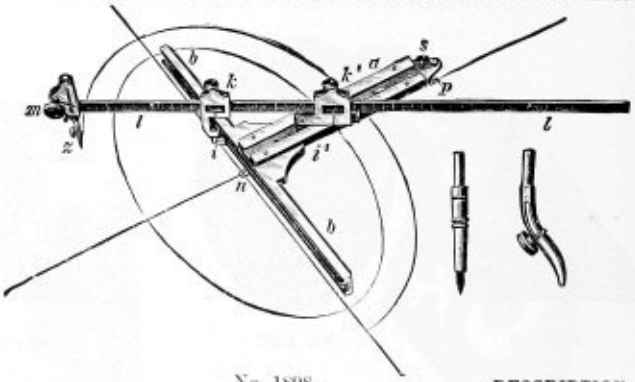
CURVES FOR MECHANICAL ENGINEERS

No. 1896.

No. 1896. Transparent Amber Curves for Mechanical and Civil Engineers. Per set of 10 Curves in polished wooden box ..... Per set. $4 80

1897. Same Curves, of Black Amber ..... " 3 75

ELLIPSOGRAPH AND BEAM COMPASS COMBINED



No. 1898.

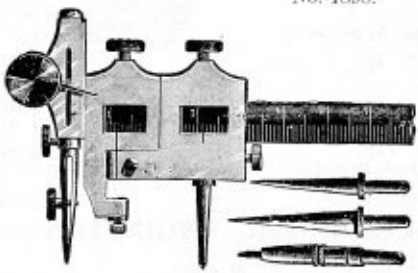


Fig. 1.

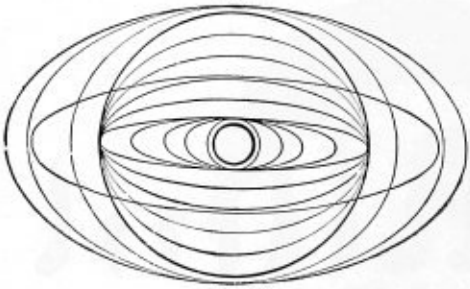


Fig. 2.

DESCRIPTION.

The apparatus consists of two main parts, the frame and the beam compass. The former forms a T with slots in both arms in which the clamps **i** and **ji** slide; these hold the beam **l-l** with pen or pencil **z**; it is divided and can be adjusted in the clamps and secured with the screws **k** and **k**; the frame can be separated in two parts **a** and **b** for keeping in a case.

For use, the frame is set and screwed together and the middle part at **n** set in the centre of the intended ellipse, the front edge of the arm **b-b** to cover exactly the major axis; then secure in position by screwing down **s** till needle point of the same pierces the paper; adjust the beam **l** in clamp **i** to the length of minor axis and secure with screw **k**; then adjust beam in clamp **i** to the length of major axis, adding 20 mm. to the same, the axis of this clamp being so much nearer to the drawing point, and secure with screw **k**; set pen or pencil **z** to correct height by means of screw **m** and draw one-half of the ellipse; after this, lift drawing point **z**, release screw **p**, reverse the instrument by swinging it 180 degrees around point **n**, reset screw **p** and drawing point **z**, and draw other half.

The instrument permits to draw all kinds of ellipses and circles, from 10 to 560 mm. major diameter; the pen with bent point to be used for ellipses of less than 22 mm. diameter. Fig. 1 shows the Beam Compass alone. Fig. 2 shows some examples.

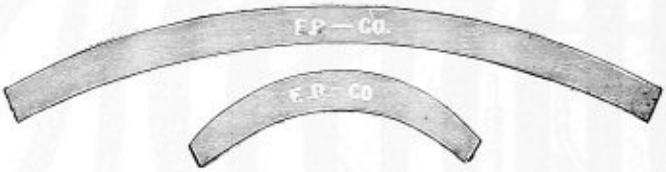
No. 1898. Ellipsograph and Beam Compass combined, complete in case. Each, $25 00

COPENHAGEN SHIP CURVES

No. 1900. Wood, set of above 45 curves, in case ..... per set, $18 00
1901. Hard Rubber, set of above 45 curves, in case ..... " 30 00
1902. Transparent Amber, set of above 45 curves, in case ..... " 35 00

Single curves of any of above patterns made to order

RAILROAD CURVES



Nos. 2000–2004.

WOODEN RAILROAD CURVES

		Per Set
No. 2000.	Wooden Railroad Curves, 10 in set, 12 to 120 inches radius, viz.: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120 inches, in wooden box	$ 3 50
2002.	Wooden Railroad Curves, 17 in set, 12 to 60 inches radius, viz.: 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 48, 51, 54, 57, 60 inches, in wooden box	6 00
2004.	Wooden Railroad Curves, 43 in set, 3 to 200 inches radius, viz.: 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 9½, 10, 12, 14, 16, 18, 20, 22, 24, 27, 30, 33, 36, 39, 42, 48, 54, 60, 66, 72, 78, 84, 90, 100, 110, 120, 130, 140, 160, 180, 200 inches, in wooden box	12 00

CARD BOARD RAILROAD CURVES

		Per Set
No. 2006.	Card Board Railroad Curves, 30 in set, viz.: 1½, 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 12 ,14, 16, 18, 20, 22, 24, 26, 28, 30, 35,40, 45, 50, 60 inches radius, in wooden box	$ 5 25
2008.	Card Board Railroad Curves, 50 in set, viz.: 1½, 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 9½, 10, 10½, 11, 11½, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120 inches radius, in wooden box	8 50

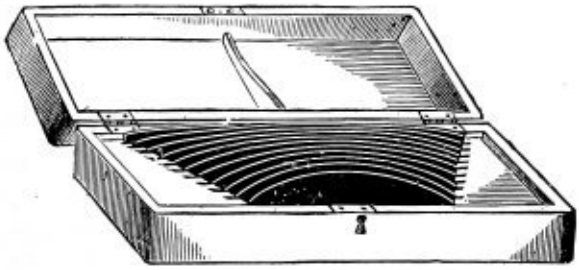
RAILROAD CURVES —Continued

METAL RAILROAD CURVES

Nos. 2112–2114.

		Per set
No. 2112.	Metal Railroad Curves, 10 in set, 12 to 120 inches radius, viz.: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120 inches, in wooden box	$ 6 20
2114.	Metal Railroad Curves, 17 in set, 12 to 60 inches radius, viz.: 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60 inches, in wooden box	10 80
2115.	Single Railroad Curves of Metal	Each, 80

HARD RUBBER RAILROAD CURVES



No. 2116.

		Per set
No. 2116.	10 Curves in set, 12 to 120 inches radius, viz.: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120 inches, in wooden box	$ 6 50
2118.	17 Curves in set, 12 to 60 inches radius, viz.: 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60 inches, in wooden box	12 00
2120.	40 Curves in set, 3 to 120 inches radius, viz.: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 66, 72, 78, 84, 90, 96, 102, 108, 114, 120 inches radius; 1 Curve 1° to 100 feet, Scale 57.30 inches; 1 Curve 2° to 100 feet, Scale 28.65 inches, in wooden box	25 00
2121.	Single Railroad Curves of Hard Rubber	Each, 80

Railroad Curves of any desired scale cut to order

RAILROAD CURVES —Continued

HARD RUBBER, WITH TANGENT

No. 2222.

No. 2222. Hard Rubber Railroad Curves, **with Tangent,** 41 in set, marked in degrees and inches to 100 feet scale, viz.:

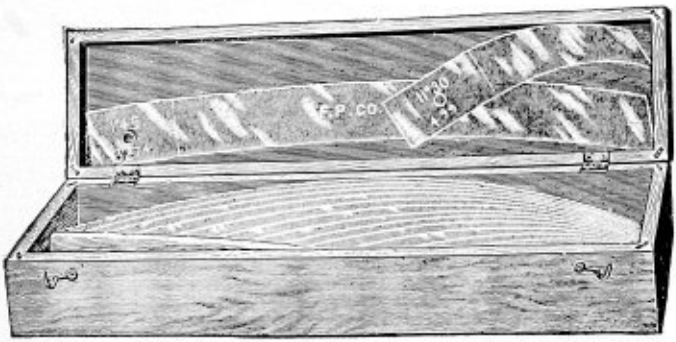
0° 30′=114.59 in.	4° 15′=13.48 in.	7° 45′=7.40 in.
1° 00′= 57.30 "	4° 30′=12.73 "	8° 00′=7.17 "
1° 15′= 45.84 "	4° 45′=12.07 "	8° 15′=6.95 "
1° 30′= 38.20 "	5° 00′=11.46 "	8° 30′=6.75 "
1° 45′= 32.74 "	5° 15′=10.92 "	8° 45′=6.55 "
2° 00′= 28.65 "	5° 30′=10.42 "	9° 00′=6.37 "
2° 15′= 25.47 "	5° 45′= 9.97 "	9° 15′=6.20 "
2° 30′= 22.92 "	6° 00′= 9.55 "	9° 30′=6.04 "
2° 45′= 20.84 "	6° 15′= 9.17 "	9° 45′=5.88 "
3° 00′= 19.10 "	6° 30′= 8.82 "	10° 00′=5.74 "
3° 15′= 17.63 "	6° 45′= 8.49 "	10° 30′=5.48 "
3° 30′= 16.37 "	7° 00′= 8.19 "	11° 00′=5.22 "
3° 45′= 15.28 "	7° 15′= 7.91 "	11° 30′=4.99 "
4° 00′= 14.33 "	7° 30′= 7.64 "	

In wooden box.....Per set, $30 00

No. 2224. Single Railroad Curves of Hard Rubber, with Tangent .....Each, 1 00

Railroad Curves of any desired scale cut to order

TRANSPARENT AMBER RAILROAD CURVES



No. 2225.

No. 2225. Transparent Amber Railroad Curves, 10 in set, 12 to 120 inch radius, viz.: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120 inches, in wooden box ..... Per set, $ 9 50

2226. Transparent Amber Railroad Curves, 17 in set, 12 to 60 inch radius, viz.: 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60 inches, in wooden box ..... Per set, 15 00

2226½. Transparent Amber Railroad Curves, 30 in set, 1¼ to 60 inch radius, viz.: 1¼, 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 7 ,8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 35, 40, 45, 50, 60 inches, in wooden box with partition ..... Per set, 26 00

2227. Transparent Amber Railroad Curves, with Tangent, 41 in set, marked in degrees and inches to 100-ft. scale, viz :

0° 30′=114.59 inches.	4° 15′=13.48 inches.	7° 45′=7.40 inches.
1° 00′= 57 30 "	4° 30′=12.73 "	8° 00′=7.17 "
1° 15′= 45.84 "	4° 45′=12.07 "	8° 15′=6.95 "
1° 30′= 38.20 "	5° 00′=11.46 "	8° 30′=6.75 "
1° 45′= 32.74 "	5° 15′=10.92 "	8° 45′=6.55 "
2° 00′= 28.65 "	5° 30′=10.42 "	9° 00′=6.37 "
2° 15′= 25.47 "	5° 45′= 9.97 "	9° 15′=6.20 "
2° 30′= 22.92 "	6° 00′= 9.55 "	9° 30′=6.04 "
2° 45′= 20.84 "	6° 15′= 9.17 "	9° 45′=5.88 "
3° 00′= 19.10 "	6° 30′= 8.82 "	10° 00′=5.74 "
3° 15′= 17.63 "	6° 45′= 8.49 "	10° 30′=5.48 "
3° 30′= 16.37 "	7° 00′= 8.19 "	11° 00′=5.22 "
3° 45′= 15.28 "	7° 15′= 7.91 "	11° 30′=4.99 "
4° 00′= 14.33 "	7° 30′= 7.64 "	

In wooden box with partitions ..... Per set, $40 00

TRANSPARENT AMBER RAILROAD CURVES
—Continued

No. 2228. Transparent Amber Railroad Curves, with Tangent, 55 in set, marked in degrees and inches to 100-foot scale, viz.:

0° 15′=229.18 inches.	5° 00′=11.46 inches.	9° 30′=6.04 inches.
0° 30′=114.59 "	5° 15′=10.92 "	9° 45′=5.88 "
0° 45′= 76.39 "	5° 30′=10.42 "	10° 00′=5.74 "
1° 00′= 57.30 "	5° 45′= 9.97 "	10° 30′=5.48 "
1° 15′= 45.84 "	6° 00′= 9.55 "	11° 00′=5.22 "
1° 30′= 38.20 "	6° 15′= 9.17 "	11° 30′=4.99 "
1° 45′= 32.74 "	6° 30′= 8.82 "	12° 00′=4.78 "
2° 00′= 28.65 "	6° 45′= 8.49 "	12° 30′=4.59 "
2° 15′= 25.47 "	7° 00′= 8.19 "	13° 00′=4.42 "
2° 30′= 22.92 "	7°15′ = 7.91 "	13° 30′=4.25 "
2° 45′= 20.84 "	7° 30′= 7.64 "	14° 00′=4.10 "
3° 00′= 19.10 "	7° 45′= 7.40 "	14° 30′=3.96 "
3° 15′= 17.63 "	8° 00′= 7.17 "	15° 00′=3.83 "
3° 30′= 16.37 "	8° 15′= 6.95 "	16° 00′=3.59 "
3° 45′= 15.28 "	8° 30′= 6.75 "	17° 00′=3.38 "
4° 00′= 14.33 "	8° 45′= 6.55 "	18° 00′=3.20 "
4° 15′= 13.48 "	9° 00′= 6.37 "	19° 00′=3.03 "
4° 30′= 12.73 "	9° 15′= 6.20 "	20° 00′=2.88 "
4° 45′= 12.07 "		

In wooden box with partition..... Per set, $52 00

No. 2229. Single Railroad Curves of Transparent Amber..... Each, 1 00

No. 2230. Single Railroad Curves of Transparent Amber, with Tangent.. Each, 1 20

Railroad curves of any desired scale cut to order

SHIPPING DEPARTMENT, FACTORY

DRAWING BOARDS

BEST WORKMANSHIP **WELL SEASONED MATERIAL**

No. 2250.

No. 2250. Pine wood, ½ inch thick, with end cleats.

Size, inches	12×17	15×21	20×26	23×31
Each	$0 70	90	1 25	1 75

No. 2252.

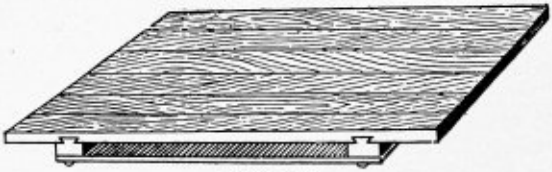
No. 2252. Pine wood, ¾ inch thick, with two drawing surfaces and end cleats.

Size, inches	12×17	15×21	20×26	23×31	31×42
Each	$0 70	90	1 25	1 75	3 50

No. 2253.

No. 2253. Bass wood, ¾ inch thick, with two drawing surfaces and end cleats.

Size, inches	12×17	16×21	18×24	20×26	23×31	31×42
Each	$0 65	75	95	1 10	1 50	2 50



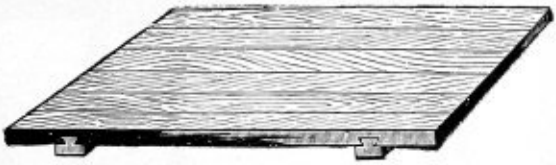
No. 2253S.

No. 2253S. Pine wood Drawing Board, with pockets on lower side and slot for T square, specially adapted for school use, board ¾ inch thick, size 20×27 inches.....Each, $1 75

Any size drawing boards or horses made to order on short notice

DRAWING BOARDS —Continued

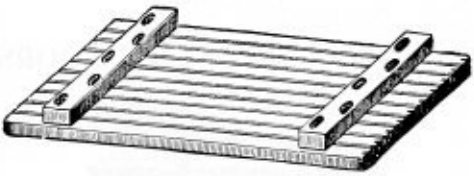
BEST WORKMANSHIP **WELL SEASONED MATERIAL**



No. 2254.

No. 2254. Pine wood, $\frac{7}{8}$ inch thick, with hardwood cleats dovetailed to allow contraction and expansion.

Size, inches	20×26	23×31	31×42
Each	$1 75	2 50	4 50



No. 2256.

No. 2256. Drawing Board, pine wood, lined with hardwood, with screws passing through the edges in slots, with metal bushings, which allow the screws to move when board contracts.

Size, inches	23×31	31×42	36×55	42×60	48×72	48×84
Each	$4 00	6 50	10 00	12 00	16 50	20 00

2257. Drawing Board, like No. 2256, with hardwood cleats dovetailed into the board to allow for contraction and expansion.

Size, inches	23×31	24×36	31×42	36×55	42×60	48×72
Each	$3 50	4 00	5 00	8 00	10 00	14 50

Any size drawing board made to order on short notice

PINE WOOD HORSES

No. 2258.

No. 2259.

No. 2258. Pine wood Horses, 37 inches high, 38 inches long.....Per pair, $5 00
2259. Same as above, with sloping top ledges..... " 5 50

PINE WOOD ADJUSTABLE HORSES

No. 2260.

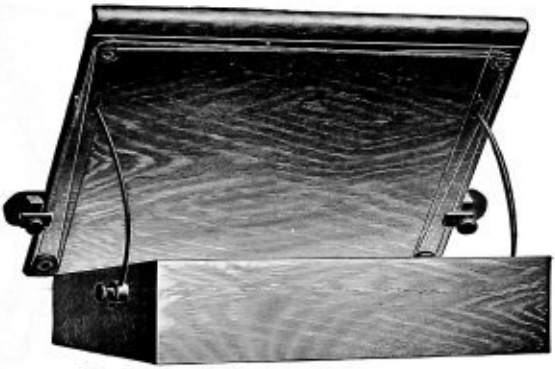
No. 2260. Adjustable wooden Horses, 36 inches long, adjustable in height from 37 to 47 inches on level or slope.....Per pair, $7 00

THE "STUDENTS'" ADJUSTABLE DRAWING CABINET

No. 2261. Front view of Drawing Cabinet.

This outfit is very handy and convenient for placing on a table or working bench, and can be easily carried about from room to room. It has the adjustable parallel rule fitted with cord and brass pulleys. With this device the rule is always parallel with the edge of the board, and cannot become disarranged. The use of the common T square is therefore obviated.

At the back edge of the drawing board there is a groove for holding pencils, erasers, etc. The board is hinged at the front to the box, and papers can be kept in the space beneath. There is also a large drawer fitted at the front which is handy for tools, drawing material, etc.



No. 2261. Back view of Drawing Cabinet.

The top is raised by strong curved metal rods, and can be kept in any position by thumb nuts at each end.

			Without adjustable parallel rule	With adjustable parallel rule
No. 2261.	**"Student's"** Adjustable Drawing Cabinet, 17×21 inches	Each,	$ 9 00	$12 00
2262.	**"Student's"** Adjustable Drawing Cabinet, 22×26 inches	"	11 00	14 00
2263.	**"Student's"** Adjustable Drawing Cabinet, 24×36 inches	"	12 00	16 00

THE "SIMPLEX" DRAWING STAND

Besides being very firm it is the simplest table ever made. The board is similar to No. 2256 while the stand is hardwood, nicely finished. This stand can be raised or lowered and put at any angle by only loosening the nut at the right, which allows the center brace to slide in the slots of the legs. The board is held to the stand by two wooden pins put through the cleats underneath board. Can be quickly folded and put aside when not in use.

No. 2265–2267.

No. 2265.	Stand only	Each.	$ 6 50
2266.	Stand, with Drawing Board, 31×42 inches	"	12 00
2267.	" " " " 36×55 "	"	15 00

DRAWING TABLES

"JEFFERSON" ADJUSTABLE DRAWING TABLES

No. 2268.

The construction of the "Jefferson" Adjustable Drawing Table is very simple and yet exceedingly substantial.

The top can be tilted and clamped firmly at any angle. The height of the table is adjustable from 38 to 48 inches by means of spreading or closing the legs. A pin and clamp inserted in the cam-shaped piece of the rear legs firmly holds the adjustment.

The stand is made of well-seasoned oak and the top of selected white pine.

No. 2268A.	"Jefferson" Adjustable Drawing Table, board 36×48 in. . . .	Each,	$16 00
2268B.	" " " " " 42×60 " . . .	"	18 00
2268C.	" " " " " 48×66 " . . .	"	21 00
2268D.	" " " " " 48×72 " . . .	"	24 00

DRAWING TABLES —Continued

"LAKESIDE" DRAWING TABLES

No. 2271.

This drawing table is of a very simple but durable construction, made entirely of wood. The table is very light, and as it folds up flat it is easy to carry and therefore especially adapted for field or camp use.

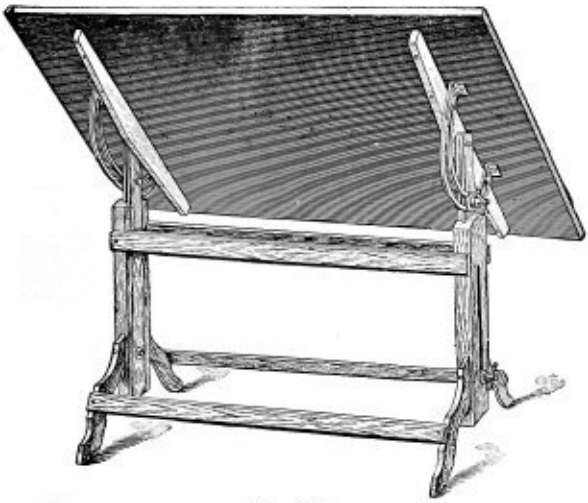
The top is made of selected, kiln-dried white pine, the trestle of well-seasoned, shellac-finished hardwood.

No. 2271.	**"Lakeside"** Drawing Table with Board, 23×31 inches	Each,	$ 8 00
2272.	" " " " " 31×42 "	"	10 00
2273.	" " " " " 33×55 "	"	13 00
2274.	" " " " " 36×60 "	"	20 00
2274½.	" " " " " 48×72 "	"	27 00

Any special size made to order at short notice

DRAWING TABLES —Continued

NORWOOD DRAWING TABLES



No. 2275.

The "Norwood" drawing table can be raised or lowered and set to any desired inclination for standing or sitting position, and can be folded when not in use.

The top is made of thoroughly dried selected pine wood and the stand of well-seasoned oak with fine shellac finish.

No. 2275.	**"Norwood"** Drawing Table,	23	×	31	inches,	with	Board	.....	Each,	$ 8 50
2276.	"	"	"	31	×	42	"	"	" ..... "	10 00
2277.	"	"	"	33	×	55	"	"	" ..... "	13 50
2278.	"	"	"	36	×	60	"	"	" ..... "	20 00
2279.	"	"	"	48	×	72	"	"	" ..... "	27 00

Any special size made to order at short notice

DRAWING TABLES —Continued

"CHICAGO" DRAWING TABLES

No. 2280.

The "Chicago" Drawing Tables are very strongly constructed and made of perfectly clear stock. Boards stand 40 inches above floor when level. The drawing board can be tilted to any angle, either front or back, nearly to a perpendicular position, by means of the simple device shown on illustration.

The box attached to trestle will be found very convenient for holding roll of drawing papers, tracing cloth, ink, tools, etc.

The parallel rule is fitted to the drawing board by means of a cord and brass pulleys, which keep it always in perfect adjustment and render the use of a T square unnecessary. Each table is also furnished with an adjustable tray swinging on a double-jointed bracket.

		Without adjustable parallel rule	With adjustable parallel rule
No. 2280.	"Chicago" Drawing Table, 31×42 inches . . Each,	$15 00	$19 00
2281.	" " " 36×48 " . . "	19 00	23 00
2282.	" " " 42×60 " . . "	24 00	28 00

Any special size made to order on short notice

DRAWING TABLES —Continued

"STAR" FOLDING DRAWING TABLES

No. 2285.

This is a low priced, but very firmly and substantially made adjustable drawing stand. It is well braced and will stand perfectly rigid. The table can be folded, and as it is very light, it can be moved about conveniently. When folded the table takes up very little floor space, which makes it very useful for offices, where floor space is a consideration and where a drafting table is only used at intervals or as an inspection table. Top made of selected pine and stand is seasoned hardwood.

No. 2285.	**"Star"** Folding Drawing Table, 24×32 in., 30 in. high	Each,	$5 00
2286.	" " " " 32×42 " 38 " "	"	7 50
2287.	" " " " 37×48 " 38 " "	"	9 00

Any special size made to order on short notice

DRAWING TABLES —Continued

POST'S "PRIMO" ADJUSTABLE METAL DRAWING TABLE

Nos. 2294.

The "Primo" Adjustable Drawing Table is superior to all others on the market, on account of its extremely simple, but very strong construction, which makes the table stand absolutely firm in any position and allows it to be adjusted either in slant or height with the utmost convenience.

To raise or lower the table it is only necessary to turn the small crank in the middle of the stand, attached to the continuous screw, which works the rack and pinion in the uprights. No bar or lock is necessary; the top remains firmly at any height, as it is impossible to lower it without turning the crank.

The clamping attachment for adjusting the slant of the top is automatic. To unlock the clamp simply pull the small handle underneath the front edge of the top towards you (see illustration on next page), give the top the desired slant, let go of the handle and it will instantly clamp automatically, making the top absolutely rigid.

The top is a perfect drawing board made of selected soft pine wood: the cabinet, drawers and shelves are of seasoned, fine polished hardwood; the stand is of best quality iron, finished in black enamel.

The cross rods on the iron stand serve as footrest.

For prices see page No. 251

DRAWING TABLES —Continued

POST'S "PRIMO" ADJUSTABLE METAL DRAWING TABLES

No. 2294.

No. 2294.	Post's "Primo" Drawing Table,				31×42 inches,	with	Top	....	Each,	$20 00
2295.	"	"	"	"	36×55	"	"	"	.... "	28 00
2296.	"	"	"	"	42×60	"	"	"	.... "	35 00
2297.	"	"	"	"	48×72	"	"	"	.... "	42 00

Any special size made to order on short notice

EXTRAS FOR POST'S "PRIMO" TABLES

A.	Round Swing Tray	Each,	$2 00
B.	Drawer and Swing Tray	"	3 00
C.	Cabinet 14×18×30 in., with 3 Drawers	"	7 00
D.	Sliding Parallel Ruler, complete for any table	"	8 00

The Sliding Ruler consists of a hardwood lined straight edge fastened at both ends to a wire which travels on pulleys attached to four corners of the top. This does away with the T square entirely, and affords a perfect parallel motion.

The above attachment can be put on any drawing board or table, and in ordering always state exact length of board.

DRAWING TABLES —Continued

THE "PROGRESS" DRAWING TABLE

Latest Improved

The frames are made of best quality gray iron, thoroughly braced and bolted together; no springs or set-screws to get loose.

All tops are made of carefully selected white pine, kiln dried, tongued and glued together, with hardwood edges secured to back with heavy screws running in oval slots with metal bushing, allowing free play of screws when board contracts.

Tops can be adjusted to any angle, from a horizontal to a vertical position without stooping or moving from seat, and table stands rigid in any position.

No. 2302.

No. 2302.	"Progress"	Drawing	Table,	with	top	32×42	inches	.....	Each,	$15 00
2303.	"	"	"	"	"	37×60	"	.....	"	25 00
2305.	"	"	"	"	"	40×72	"	.....	"	30 00
2306.	"	"	"	"	"	40×84	"	.....	"	35 00

Larger sizes made to order

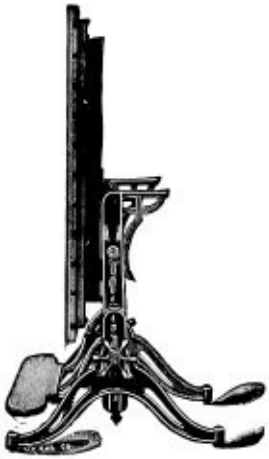
DRAWING TABLES —Continued

Latest Improved

THE "ADVANCE" DRAWING TABLES

With interchangeable foot rest, polished oak drawer and tray, 8×12½ inches on swing arm, also oak tray with paneled sides, used for receptacle for drawing papers, instruments, etc.

No. 2307.



No. 2307. Folded, end view.

No. 2307.	With Top,	32×42 inches	Each,	$25 00
2308.	" "	37×48 "	"	30 00
2309.	" "	40×72 "	"	40 00
2310.	" "	40×84 "	"	45 00
2311.	" "	42×96 "	"	50 00
2312.	" "	48×120 "	"	55 00

Larger sizes to order

ATTACHMENTS FOR DRAWING TABLES

For Nos. 2307 and 2312, Progress and Advance Tables

A.	Foot Rest	Each,	$1 50
B.	Circular Swing Tray	"	2 00
C.	Drawer and Swing Tray	"	3 00
D.	Cabinet, 12×16×30 inches, 3 drawers	"	8 00

DRAWING TABLES —Continued

F. POST CO.'S ROLLER ADJUSTMENT DRAWING TABLES

No. 2315.

This table is very simple and neat in construction and design, extremely rigid and easy to adjust. It is adjustable in height from 35 to 48 inches by a hand wheel carried on a longitudinal tube with a pinion on either end, meshing into racks fastened to the stands to which the top is attached. The table is firmly locked at the desired height by means of a hand nut, the tightening of which releases the inner roller and substitutes a frictional bearing, while at the same time locking the pinions against the rack, making a revolution impossible.

The slant of the top is adjusted by means of a hand nut working on a rod passing through a brace, the ends of which impinge on the stands, clamping them so rigidly to quadrants attached to the top of the table that it is impossible to shift, regardless of any weight on the edge of the table.

The stand is made of black enameled iron and the board of selected pine wood. Style No. 2256.

No. 2315.	Post's Roller Adjustment Table, with Top 31×42 inches . . . . Each,	$28 00
2315A.	" " " " " " 36×55 " . . . . "	33 50
2315B.	" " " " " " 42×60 " . . . . "	35 00
2315C.	" " " " " " 42×72 " . . . . "	40 00
2315D.	Swinging Shelf for above Table, attachable at either side. "	2 50

Larger sizes in stock or made to order

METAL DRAWING TABLES —Continued

ILLUSTRATORS' DRAWING TABLES

Patented
No. 2316.

Patented
No. 2317.

No. 2316. **"Illustrators"** Drawing Table, with special improved device for adjusting the slant of the top, without casters.

Oak Top, 20×23 inches	Each,	$ 6 25
" " 23×26 "	"	6 50
" " 23×26 " with folding arm and plain shelf	"	7 00
Ash or Oak Top, 23×26 inches, with folding arm, drawer and shelf	"	8 00

No. 2317. **"Illustrators"** Drawing Table, with special improved device for adjusting the slant of the top, and device for rotating the top without changing the angle of the slant, with casters.

Oak Top, 23×26 inches	"	7 50
" " 23×26 " with folding arm and plain shelf	"	8 00
" " 23×26 " with folding arm, drawer and shelf	"	9 00
Black Walnut Top, 23×26 inches, folding arm, drawer and shelf, neatly ornamented, suitable for office	"	11 00

The "Illustrators" Drawing Tables have a great many improvements not usually found in any other table. They are provided with the wheel lift, can be raised or lowered, and in place of the clamping device usually employed, they have a sector with rows of concentric holes, into which a stop or pin is actuated by a spring, thus holding the top firmly, without any possibility of its slipping, as is the case with many tables of other makes.

Removing the front strip of the top and putting in its place a shelf and a rack, transforms it into one of the best easels at a very small expense. (See page 256.) The easel can be applied to all tables except No. 2316.

The table can be taken apart for shipment and put together again firmly and quickly.

The stands are enameled iron, the tops of either well seasoned Ash or Oak, or if desired, of Black Walnut or Cherry Wood.

METAL DRAWING TABLES —Continued

STUDIO DRAWING TABLES

No. 2319

Patented. No. 2318.

Patented.
No. 2318 used as Easel.

No. 2318 **"Victor"** Drawing Table, with latest improved device for slanting top, also device for rotating top without changing the angle of the slant; with wheel lift for raising or lowering end sector with automatic spring top.

No. 2318A.	Oak Top, 24×26 inches	Each,	$12 00
2318B.	" " 24×26 " with folding arm, drawer and shelf	"	14 00
2318C.	Black Walnut, 24×26 in. top, with folding arm, drawer and shelf	"	16 00

No. 2319, "Victor" Drawing Table, same as No. 2318, but with shelf on back of table, which always retains its level position.

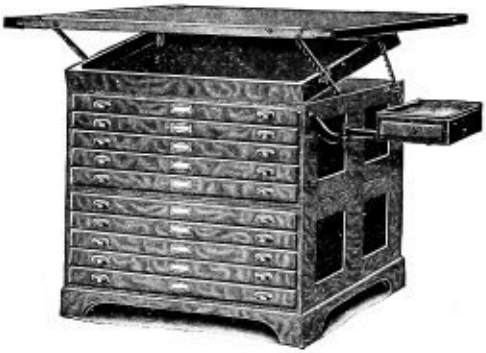
No. 2319A.	Oak Top, 24×26 inches	"	16 00
2319B.	" " 24×26 " with folding arm, drawer and shelf.	"	19 00

If these tables are wanted with foot rests, add $1.00 to the above prices.

If wanted with foot rests, shelves and racks for easel, add $3.00 to the above prices.

DRAFTING ROOM FURNITURE

"COMBINATION" Sectional FILING CABINET and DRAWING TABLE



No. 2320A.

This combination is composed of two filing sections and base made of well seasoned, quartered oak. It is cut out sufficiently high so as to give foot space to stand up close. Attached to the cabinet is a swinging arm with tray and drawer. The top is a drawing board of selected pine and is arranged so that it can be made to project 6 to 8 inches over the front edge of the cabinet. The top can be raised or lowered 35 to 43 inches horizontally and can be lifted to any angle.

The parts are securely fastened together so as to make a rigid outfit.

The cabinet has ten drawers, 32×42½×2 inches deep, inside measurement.

No. 2320A.	Combination Sectional Filing Cabinet and Drawing Table, 37×54 inches	Each,	$55 00
2320B.	Combination Sectional Filing Cabinet and Drawing Table, 37×60 inches	"	58 00
2320C.	Combination Sectional Filing Cabinet and Drawing Table, 40×72 inches	"	62 00

We can also furnish these tables with flat, non-adjustable top.

No. 2321D.	Combination Sectional Filing Cabinet and Drawing Table, 37×54 inches, flat top	"	47 00
2321E.	Combination Sectional Filing Cabinet and Drawing Table, 37×60 inches, flat top	"	50 00
2321F.	Combination Sectional Filing Cabinet and Drawing Table, 40×72 inches, flat top	"	54 00

DRAFTING ROOM FURNITURE —Continued

SECTIONAL FILING CABINET

For Filing Drawings and Blueprints Flat

No. 2322A.

The illustration shows three sections, base with drawer and top. Our filing cabinets are made in sections holding five drawers 32×42½×2 inches deep, inside measurement.

The sections are uniformly constructed in size so that they will always fit properly over each other and cabinets may be built up of sections ordered at different times.

The top fits any section closed at the top and is made in one style only. The base is made in two styles, with and without drawer.

The section, top and base are made of well seasoned, quartered oak.

The drawers slide in grooves and are covered in the rear in order to prevent the drawings from curling up.

The workmanship is of the best. The joints are well glued so as to make the cabinet firm and durable.

The drawers are fitted with solid polished brass handles and label holders.

The cabinets are finished in golden oak, rubbed polish.

No. 2322A.	Section of five drawers, 32×42½×2 inches	Each,	$18 00
2322B.	Base with drawer 5½ inches deep	"	7 00
2322C.	" without drawer	"	4 00
2322D.	Top	"	5 25

Other sizes or styles made to order

DRAFTING ROOM FURNITURE —Continued

THE "BURLIN" VERTICAL FILING CABINET

Cabinet Closed.
Occupies but 3¾ sq. feet of floor space. Constructed **Airtight** and **Dust-Proof.**

No. 2327A.

Cabinet Open.
Ready for use. Notice Combination File and Table.

The **"Burlin"** Vertical Filing Cabinet represents a most radical change from any method of filing and indexing used heretofore. Its features combine the best modern methods of indexing and recording with the most up-to-date filing cabinet, permitting to take out any drawings or prints for inspection instantly without changing their position in the file and without disturbing the order of the balance.

It sets close to the wall, occupying but 3¾ square feet of floor space, contains twenty large pockets properly indexed, accommodating 800 to 1,000 prints, filed vertically, ready for instant reference. When opened it also furnishes a large table for inspection of contents, and it may also be used as a drawing table. In this respect the "Burlin" Vertical Filing Cabinet stands alone.

For convenience and preservation of tracings, drawings and prints, the "Burlin" Cabinet has no equal for either system or price. It saves much valuable time on account of its instant reference features for quick filing and quick finding.

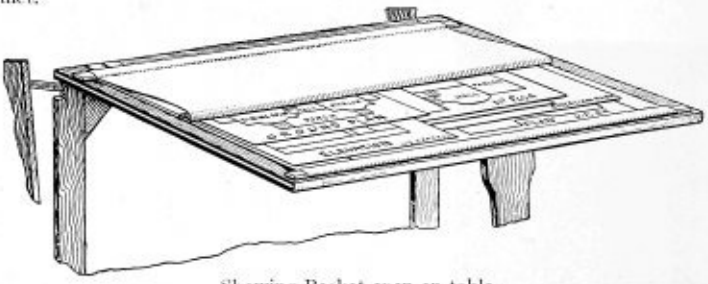
The "Burlin" is made in two sizes and stands only 12 inches deep when closed. It is constructed with the "Burlin" patent dust proof method, making it airtight and free from dust and dirt. It contains 20 pockets of heavy weight manilla paper, having a total capacity of from 800 to 1,000 prints and the cabinet is made of dried and seasoned lumber and best of workmanship and finish.

To extract any print for inspection or reference, raise up the lid and pull out the top of the front. This allows an expansion of six inches to better enable the operator to separate the tops of the pockets for withdrawing the print desired, or lifting out the pocket with its entire contents. After pulling out top of front, which lets the front hang free, reach down on either side about half way and pull the bottom of front out and up. This releases the leg brace, which falls down and forms a support for the table. The table may be set at any angle desired and used as an easel or drawing board.

DRAFTING ROOM FURNITURE —Continued

THE "BURLIN" VERTICAL FILING CABINET—Continued

In lifting out any pocket, grasp both supporting rods at top of pocket, raise up and pull toward you on the table. Then fold back the flap of pocket toward the cabinet.

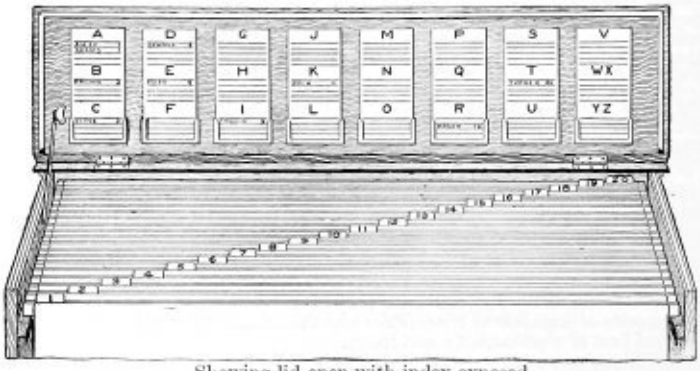


Showing Pocket open on table.

The prints filed up side down are now before you right side up, with the lower half bearing name and title exposed to plain view. Any print may be extracted without disturbing the balance.

Each pocket is equipped with a changeable index tab and prints may be classified as best pleases the individual, either numerically or alphabetically.

Each cabinet is equipped with a set of index cards, attached to under side of lid, which, when raised, brings them in full view and correct position for reference.



Showing lid open with index exposed.

"Burlin" Vertical Filing Cabinet.

	Outside Dimensions	Dimensions of pockets		Plain Oak
No. 2327A.	46×44 inches	36×40 inches, containing 20 pockets	Each,	$32 00
2327B.	40×48 inches	30×44 inches, containing 20 pockets	"	32 00

DRAUGHTMEN'S STOOLS

No. 2328A.

No. 2329A.

		Each
No. 2328A.	Draughtsmen's Stool, cane seat, golden oak or in mahogany finish, 18, 24 and 30 inches when screwed down. Can be raised 5 inches.	$4 75
2328B.	Draughtsmen's Stool, wood seat, golden oak or in mahogany finish, 30 inches when screwed down. Can be raised 5 inches	4 50
2329A.	Draughtsmen's Stool, cane seat, golden oak or in mahogany finish, height adjustment from 30 to 35 inches	8 50
2329B.	Draughtsmen's Stool, same as 2329A, but without back	6 50

DUSTING BRUSHES

No. 2328½.

		Each
No. 2328½.	Dusting Brush, invisible wire drawn, 8-in. brush with 6-in. handle.	$0 65
2329½.	Dusting Brush, all bristle, set in pitch, 8-in. brush with 6-in handle.	80

THUMB TACKS

Pins Warranted Not to Push Through Heads

Standard Brass Thumb Tacks

Nos. 2330–2340.

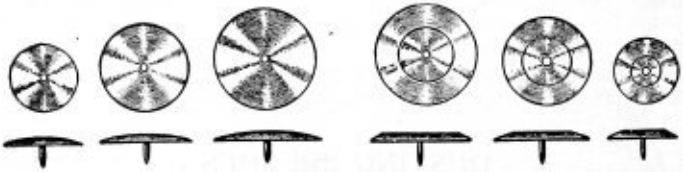
No. 2330.	Brass, round heads, $\frac{3}{8}$ inches diameter	Per dozen,	$0 15
2332.	" " " $\frac{1}{2}$ " "	"	20
2334.	" " " $\frac{5}{8}$ " "	"	25

Standard German Silver Thumb Tacks

No. 2336.	German Silver, round heads, $\frac{3}{8}$ inches diameter	Per dozen,	$0 20
2338.	" " " " $\frac{1}{2}$ " "	"	25
2340.	" " " " $\frac{5}{8}$ " "	"	35
2341.	" " beveled " $\frac{3}{8}$ " "	"	25
2342.	" " " " $\frac{1}{2}$ " "	"	35
2343.	" " " " $\frac{5}{8}$ " "	"	40

"PRIMO" GERMAN SILVER THUMB TACKS

Each Tack Stamped F. P. Co. **Pins Screwed in and Riveted**



Nos. 2350–2362.

No. 2350.	Finest German Silver, round heads, $\frac{3}{8}$ inches diameter	Per dozen,	$0 50
2351.	" " " " " $\frac{1}{2}$ " "	"	60
2352.	" " " " " $\frac{5}{8}$ " "	"	75
2360.	" " " beveled " $\frac{3}{8}$ " "	"	50
2361.	" " " " " $\frac{1}{2}$ " "	"	60
2362.	" " " " " $\frac{5}{8}$ " "	"	75

These Thumb Tacks are very flat, so as to offer no obstruction to either triangle or T square. They are made by hand with the utmost care.

STAMPED STEEL THUMB TACKS

Made of one piece of tough, specially hardened steel, of the best quality, they have needle finished points, thus making an excellent substitute for the regular thumb tacks, when a lower priced article is desired.

Nos. 2370–2373.

No. 2370.	Flat Heads, $\frac{5}{16}$ inch diameter	Per box of 100,	$0	40
2371.	" " $\frac{3}{8}$ " "	"		50
2372.	" " $\frac{1}{2}$ " "	"		60
2373.	" " $\frac{5}{8}$ " "	"		75

No. 2370A.

STAMPED STEEL THUMB TACKS IN TIN BOXES

One Dozen in Tin Box.

No. 2370A.	$\frac{5}{16}$ inch diameter	Per box,	$0	10
2370B.	$\frac{3}{8}$ " "	"		12
2370C.	$\frac{1}{2}$ " "	"		15

SOLID STEEL THUMB TACKS

No. 2374A. No. 2374C. No. 2374D.

No. 2374A.	Solid Round Heads, $\frac{5}{16}$ in. diameter	Per box of 100,	$0	50
2374B.	" " " $\frac{3}{8}$ " "	"		75
2374C.	" " " $\frac{1}{2}$ " "	"	1	00
2374D.	" " " $\frac{9}{16}$ " "	"	1	20

These Thumb Tacks have a thin, strong steel head, constructed so that the pin can neither push out or push through. Neat in appearance and very durable.

TACK LIFTER

No. 2375.

No. 2375. Tack Lifter and Paper Knife, nickel-plated..... Each, $0 25

Made of nickel-plated steel, a very convenient instrument for extracting Thumb Tacks, without bending the point or wrenching off the head, which occurs often when a knife is used. The handle can be used as a paper knife to remove drawings which have been glued to the board.

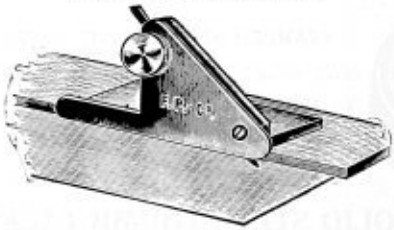
HORN CENTERS

No. 2376.

No. 2378.

No. 2376. Horn Center, plain, ¾ inch diameter.....Each, $0 10
2378. " " " with German Silver rim, ¾ inch diameter.. " 50

PAPER CUTTERS



No. 2380.

Used for cutting drawings from board or for cutting any kind of paper or bristol board. They will slide along T square or straight edge, without injuring the edge and by means of an adjustment screw they can be set so that they will cut just the thickness of the paper, without injuring the drawing board.

No. 2380. Paper Cutter, brass.....Each, $0 35
2381. " " nickel-plated..... " 40

PAPER WEIGHTS

No. 2391.

No. 2392.

No. 2391. Square Iron Paper Weight, large, with knob, 2⅞ lb., 3×7½ in. .Each, $0 75
2392. Iron Paper Weight, covered with leather, weighing about 1½ pounds, size 2½×2×1⅝ inches..... " 50
2393. Iron Paper Weight, covered with leather, weighing about 2 pounds, size 3⅜×2½×1¼ inches..... " 75

CHINESE OR INDIAN INK

Our own Importation

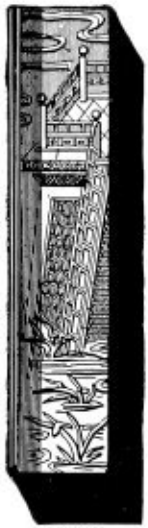
Illustrations full size

2400

2401

2406

2410



2412

No. 2414.

No. 2400.	Oval Lion Head,	2½	inches long	Each,	$0 15
2401.	" " "	3½	" "	"	25
2406.	Square Super Super	2⅞	" "	"	30
2407.	" " "	3⅝	" "	"	60
2410.	Oblong Gilt Figures,	3⅛	" " fine	"	1 50
2412.	" " "	2⅝	" " extra fine	"	3 00
2414.	" " "	3⅝	" " " "	"	3 00
2420.	Red Chinese Ink,	2⅛	" " " "	"	50
2421.	Blue " "	2⅛	" " " "	"	50
2421¼.	Yellow " "	2¼	" " " "	"	50

POST'S WATERPROOF DRAWING INKS

Full Size No. 2422.

Post's Waterproof Drawing Inks in their present perfect state are the result of not only a long series of careful scientific experiments, but also of exhaustive experience, on the subject of drawing inks. The inks are waterproof, very smooth and even flowing, are **permanent in color** and **uniform in density.**

The **Waterproof Black Ink** is made of the highest grade of material, **intense black,** so that even the finest lines will be absolutely opaque, **flows freely** and even from the pen, **dries quickly** and **is perfectly waterproof** when dry, so that color washes can be made over it with perfect safety.

The Colored Inks are uniform and true in color and have a brilliant tone, while they are absolutely waterproof. They can be used for lines or washes, for the latter they can be thinned with pure water. They can be mixed with each other to produce other shades.

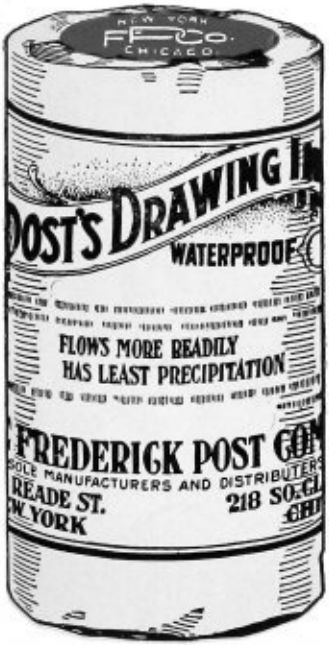
The Non-Waterproof Ink is a dead black ink, specially prepared for photo-engraving and photo-lithographing work; of great value to patent attorneys and well adapted for drawings which are to be photographed.

It can be truthfully claimed that Post's Waterproof Drawing Inks are superior to any other drawing inks made. They are sold under **a guarantee** that they possess every essential quality which drawing inks of the highest grade should have.

If a comparative test does not bear out our claims for absolute superiority, the purchase money will be cheerfully refunded. This puts the question of quality up to the man whose judgment every user thinks most of—his own.

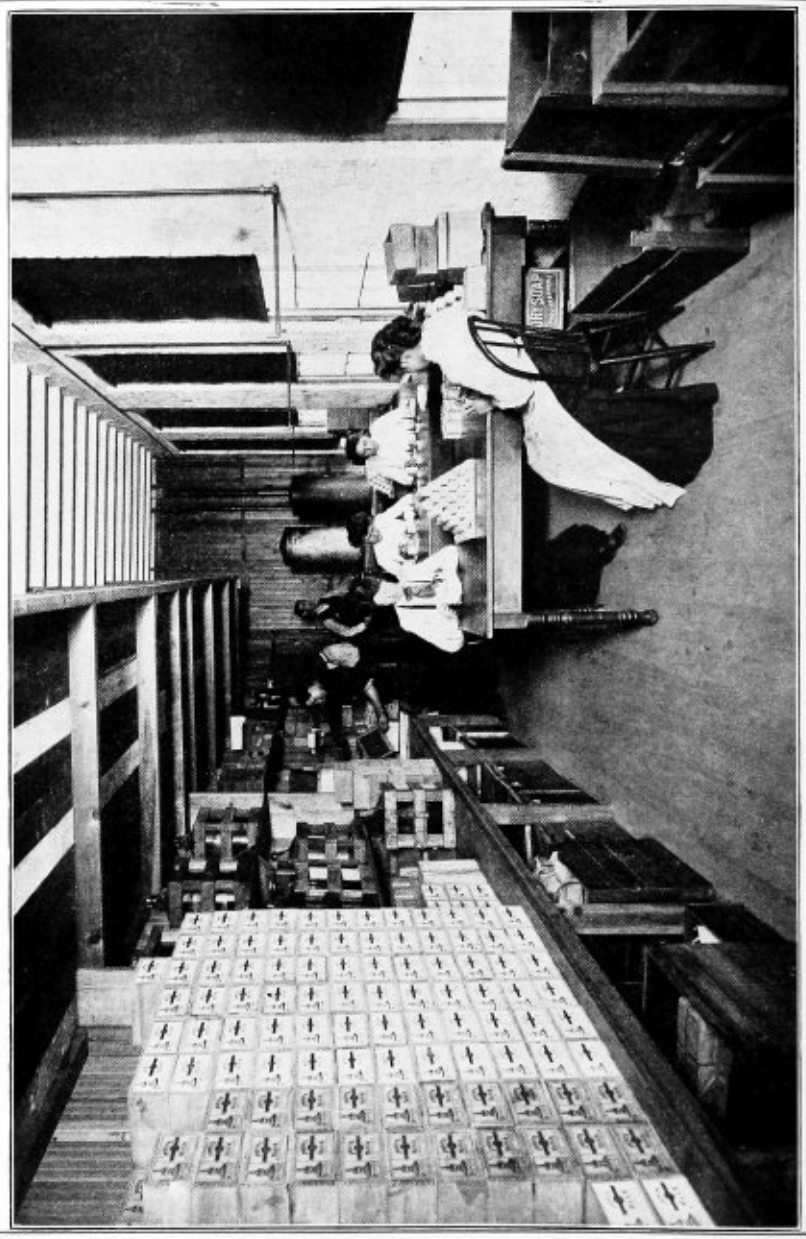
For prices and package see next page.

POST'S WATERPROOF DRAWING INKS



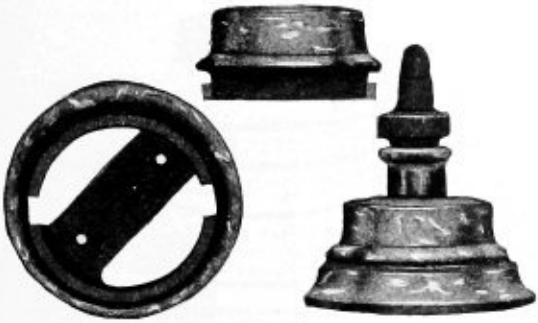
Original Wrapper—Full Size

				¾ Ounce	¼ Pint	Pint	Quart
No. 2422.	Waterproof,	Black	Each,	$0 25	$1 60	$3 00	$5 75
2422A.	"	Blue	"	25	1 60	3 00	5 75
2422B.	"	Brown	"	25	1 60	3 00	5 75
2422C.	"	Brick Red	"	25	1 60	3 00	5 75
2422D.	"	Carmine	"	25	1 60	3 00	5 75
2422E.	"	Green	"	25	1 60	3 00	5 75
2422F.	"	Indigo	"	25	1 60	3 00	5 75
2422G.	"	Orange	"	25	1 60	3 00	5 75
2422H.	"	Scarlet	"	25	1 60	3 00	5 75
2422I.	"	Vermilion	"	25	1 60	3 00	5 75
2422K.	"	Violet	"	25	1 60	3 00	5 75
2422L.	"	Yellow	"	25	1 60	3 00	5 75
2430.	Non-waterproof,	Black	"	25	1 60	3 00	5 75



DRAWING INK DEPARTMENT, FACTORY

INK BOTTLE HOLDERS



Patented.
No. 2432.

No. 2432. **Bottle Holder** for Post's Ink, Oxidized Iron, polished..... Each, $0 35

No. 2432 is quite a handy bottle holder. It is heavy and will also serve as paper weight.

No. 2433.

No. 2433. **"Triplex"** Bottle Holder, for Post's Ink, made of Metal.....Each, $0 50

No. 2433 will hold three bottles and is very useful where inks of different colors are used.

DRAWING INK STAND

No. 2434.

No. 2434. Post's Drawing Ink Stand, containing five bottles of Post's Inks Assorted to order ..... Each, $1 50

POST'S WHITE PASTE AND PHOTO MOUNTER

No. 2450.

An excellent paste for use in the drafting room, put up in air-tight glass jars

No. 2450.	Post's White Paste for Draughtsmen, 2 oz. jar	Each, $0 10
2451.	" " " " " 4 "	" 15
2452.	" " " " " 8 "	" 30
2453.	" " " " " 16 "	" 50
2554.	" " " " " 32 "	" 75
2455.	" Photomounter, 2 oz. jar	" 10
2456.	" " 8 "	" 30
2457.	" " 16 "	" 50

Larger sizes of either of the above furnished upon request.

WEIS BRUSH TUBE MUCILAGE

No. 2460.

No. 2460.	Weis Brush Tube Mucilage, small	Each, $0 05
2461.	" " " " medium	" 10
2462.	" " " " large	" 25

LIQUID DRAWING INKS

No. 2517.

No. 2226.

No. 2516.	Winsor & Newton's Chinese White	Per bottle,	$0 30
2517.	" " Indian Ink	"	30
2518.	" " Blue	"	30
2519.	" " Carmine	"	30
2520.	" " Indelible Brown Ink	"	30
2521.	" " Prout's Brown	"	30
2522.	" " Sepia	"	30
2523.	" " Gold Ink	"	30
2524.	" " Oxgall	"	30
2525.	Bourgeois Waterproof Black Ink, Small Size	"	25
2526.	" " " " Large "	"	50

DILUTING FLUID

For thinning Black or Colored Drawing Inks, to make washes on tracing cloth or coloring large areas when necessary.

No. 2530. Diluting Fluid, 4-oz. bottle ..... Each, $0 50

WATERCOLORS

Winsor & Newton's Moist Watercolors

Whole Pan.

Half Pan.

No. 2540.	Antwerp Blue	Gamboge	Olive Green		
	Blue Black	Hooker's Green, No. 1	Payne's Grey		
	Brown Ochre	" " No. 2	Permanent Blue		
	Brown Pink	Indigo	Prussian Blue		
	Burnt Sienna	Indian Red	Raw Sienna		
	Burnt Umber	Italian Pink	Raw Umber		
	Charcoal Grey	Ivory Black	Roman Ochre		
	Chinese White	King's Yellow	Sap Green		
	Chrome, Deep	Lamp Black	Terre Verte		
	Chrome Lemon	Light Red	Vandyke Brown		
	Chrome Orange	Mauve	Venetian Red		
	Chrome Yellow	Naples Yellow	Vermilion		
	Dragon's Blood	Neutral Tint	Yellow Lake		
	Emerald Green	New Blue	Yellow Ochre		
	Flake White		Per dozen	Each	
	Whole Pans		$3 00	$0 25	
	Half "		1 65	15	
No. 2541.	Alizarin Crimson	Crimson Lake	Roman Sepia		
	Alizarin Scarlet	Indian Yellow	Scarlet Lake		
	Brown Madder	Mars Yellow	Scarlet Vermilion		
	Carmine Lake	Orange Vermilion	Sepia		
	Cerulean Blue	Purple Lake	Warm Sepia		
			Per dozen	Each	
	Whole Pans		$6 00	$0 50	
	Half "		3 00	25	
No. 2542.	Cadmium Orange	Lemon Yellow	Pale Cadmium Yellow		
	Cadmium Yellow	Mars Orange	Pure Scarlet		
	Cbealt Blue	Oxide of Chromium	Violet Carmine		
	French Blue	Permanent Mauve	Viridian		
			Per dozen	Each	
	Whole Pans		$7 50	$0 65	
	Half "		3 75	35	
No. 2543.	Aureolin	Gallstone	Purple Madder		
	Aurora Yellow	Madder Carmine	Scarlet Madder		
	Burnt Carmine	Madder Lake	Rose Madder		
	Carmine	Pink Madder	Per dozen	Each	
	Whole Pans		$12 75	$1 10	
	Half "		6 40	55	
No. 2543½.	Smalt	Ultramarine Ash Blue			
	Whole Pans		Each,	$1 40	
	Half "		"	70	

BOURGEOIS FRENCH WATERCOLORS

The Bourgeois French Water Colors are put up in glass jars containing more than twice as much as the whole pans sold by other manufacturers at about the same price. They are moist and a slight rubbing of the desired colors with a moistened brush is sufficient to obtain the full richness of their tint. The colors are very brilliant in tone.

No. 2544.

No. 2547.

Series I

No. 2544.	Antwerp Blue	Emerald Green	Olive Green
	Brown Ochre	Gamboge	Payne's Grey
	Brown Pink	Green Lake	Prussian Blue
	Burnt Sienna	Hooker's Green	Prussian Green
	Burnt Umber	Indian Red	Raw Sienna
	Chinese White	Indigo	Raw Umber
	Chrome Green, Light	Italian Pink	Sap Green
	Chrome Green, Medium	Ivory Black	Sepia
	Chrome Green, Dark	Lamp Black	Terre Verte
	Chrome Yellow, Light	Lemon Yellow	Vandyke Brown
	Chrome Yellow, Med.	Light Red	Venetian Red
	Chrome Yellow, Dark	Naples Yellow	Warm Sepia
	Dragon's Blood	Neutral Tint	Yellow Ochre
	Each		$0 30

Series II

No. 2545.	Brilliant Yellow	Ultramarine Blue, Light	Vermilion, Dark
	Crimson Lake	Ultramarine Blue, Dark	Violet Light, Extra
	Dark Purple	Vermilion, Light	Violet Dark, Extra
	Scarlet Vermilion		
	Each		$0 50

Series III

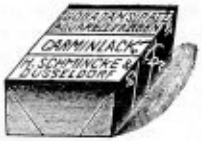
No. 2546.	Brown Madder	Cypress Green, Dark	Madder Lake, Dark
	Carmine No. 2	Geranium Rose	Rose Carthame
	Cerulean Blue	Madder Lake, Light	Scarlet Lake
	Cypress Green, Light		
	Each		$0 75

Series IV

No. 2547.	Cadmium Citron	Cadmium Yellow	Indian Yellow
	Cadmium Deep	Cobalt Blue	
	Each		$1 00

HORADAM'S PATENT MOIST WATERCOLORS

Whole Pan



Half Pan

Class A

No. 2548.

Antwerp Blue	Gamboge	Permanent Blue
Blue Black	Hooker's Green No. 1	Prussian Blue
Brown Ochre	Hooker's Green No. 2	Raw Sienna
Brown Pink	Indigo	Raw Umber
Burnt Sienna	Indian Red	Roman Sepia
Burnt Umber	Ivory Black	Sap Green
Charcoal Grey	Lamp Black	Sepia
Chinese White	Light Red	Terre Verte
Chrome Yellow, Light	Mauve	Vandyke Brown
Chrome Yellow, Deep	Magenta	Venetian Red
Chrome Yellow, Orange	Naples Yellow	Vermilion, Chinese
Chrome Green	New Blue	Vermilion, Light
Dragon's Blood	Olive Green	Zinober Green, Light
Emerald Green	Payne's Grey	Zinober Green, Deep

Whole Pans ..... Each, $0 20
Half " ..... " 10

Class B

No. 2548B.

Carmine Lake	Rose Lake, Light	Scarlet Lake
Crimson Lake	Rose Lake, Deep	Violet Lake
Geranium Lake	Rose Carthame	

Whole Pans ..... Each, $0 25
Half " ..... " 15

Class C

No. 2548C.

Brown Madder	Cobalt Blue	Pink Madder
Cadmium Yellow, Light	Indian Yellow	Purple Lake
Cadmium Yellow, Deep	Madder Lake, Light	Ruben's Madder
Cadmium Yellow, Orange	Madder Lake, Deep	Ultramarine Blue
Cerulean Blue	Madder Lake, Rose	Vert Emeraude

Whole Pans ..... Each, $0 35
Half " ..... " 18

Class D

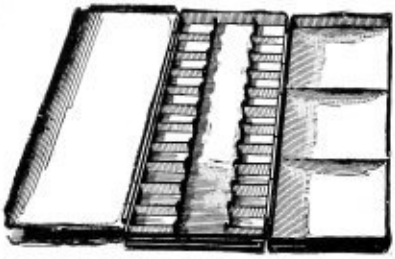
No. 2548D.

Aureolin	Carmine	Purple Madder
Burnt Carmine	Madder Carmine	Violet Carmine

Whole Pans ..... Each, $0 50
Half " ..... " 25

EMPTY JAPANNED TIN BOXES

For Moist Colors in Pans

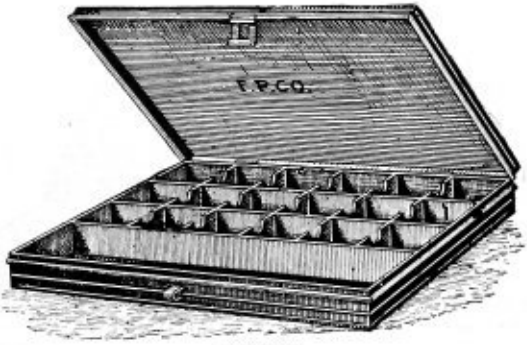


No. 2554.

No. 2550.	For	6	Whole or	12	Half Pans	Each,	$0 80
2551.	"	8	"	16	"	"	90
2553.	"	10	"	20	"	"	1 05
2554.	"	12	"	24	"	"	1 15
2555.	"	16	"	32	"	"	1 30
2557.	"	18	"	36	"	"	1 40
2558.	"	24	"	48	"	"	1 60

EMPTY JAPANNED TIN BOX

For Bourgeois Water Colors in Glass Jars

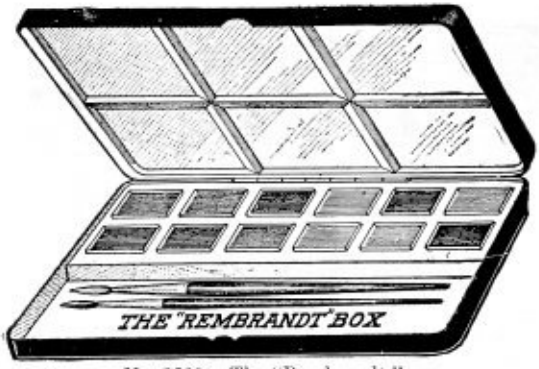


No. 2559.

No. 2559. Japanned Tin Boxes for Bourgeois French Water Colors, with space for brushes, 18 partitions ..... Each, $1 50

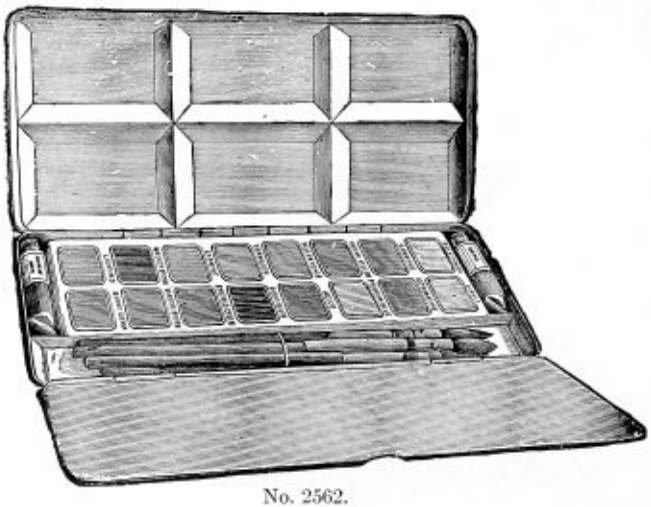
2559½. Japanned Tin Boxes like No. 2547A but with 24 partitions ..... " 2 00

WATERCOLOR BOXES—FILLED



No. 2560. The "Rembrandt."

No. 2560. "Rembrandt" Water Colors, 12 moist colors, in pans, and brushes, in japanned tin ..... Each, $0 35



No. 2562.

No. 2561. Small Murillo with 12 colors, etc ..... Each, $0 75

2562. The "Murillo" Water Color Box, japanned tin, 7½×3½ inches, with inside lid, 16 moist colors in metal pans, 1 tube each of Sepia and Chinese white, 2 brushes ..... " 1 00

WATERCOLOR BRUSHES

BEST QUALITY

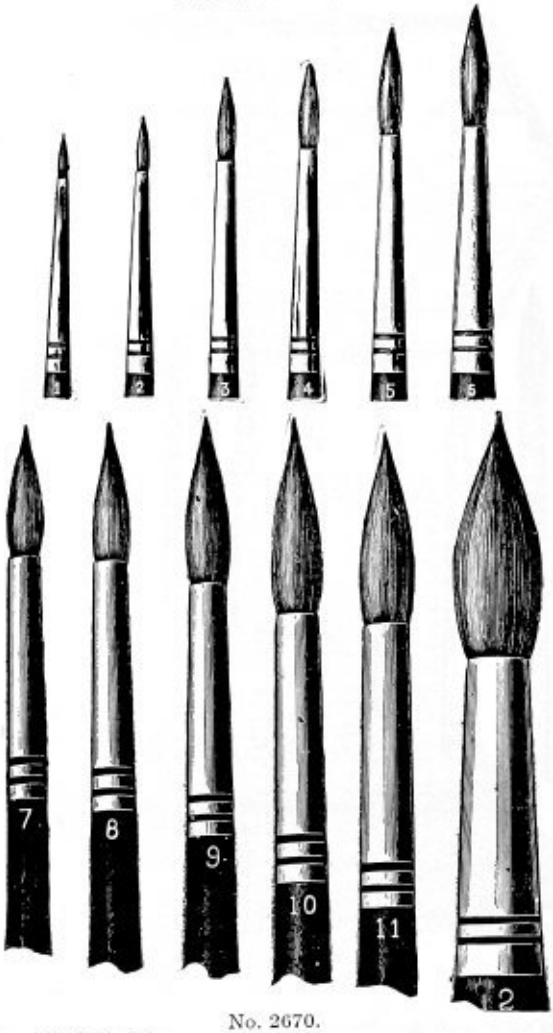
Illustrations full size

Nos. 2660-2661.

No. 2660.	Camel Hair in Quills	1	2	3	4	5	6	7	8
	Each	$0 05	05	06	06	08	08	10	10
2661.	Red Sable in Quills	1	2	3	4	5	6	7	8
	Each	$0 12	15	20	25	30	35	50	60

BRUSHES —Continued

Illustrations full size



No. 2670.

No. 2670. Camel Hair, in Tin.

No.	1	2	3	4	5	6	7	8	9	10	11	12
Each.	$0 06	08	08	10	10	12	18	20	20	25	30	35

BRUSHES —Continued

Of Camel Hair and Red Sable

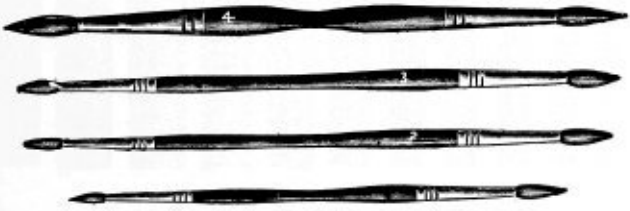
Illustrations one-half-size

No. 2680.

No. 2680. Double Pointed **Camel Hair** Brushes, in Tin.

No	1	2	3	4	5	6
Each	$0 30	35	40	50	60	70

Illustrations less than one-half size



No. 2683.

No. 2683. Double Pointed **Red Sable** Brushes, in Albata.

No	1	2	3	4
Each	$0 60	90	1 50	2 40

BRUSHES —Continued

RED SABLE IN ALBATA, WITH HANDLE

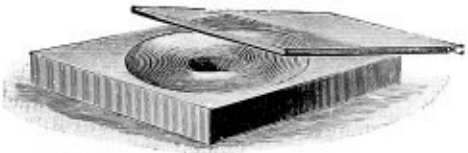
Illustrations full size

No. 2690.

No. 2690. **Red Sable Brushes,** in Albata, with Handle.

No.....	1	2	3	4	5	6	7	8	9	10	11	12
Each.....$	0 16	18	25	30	40	55	70	90	1 20	1 50	2 00	2 50

INK SLABS AND COLOR SAUCERS

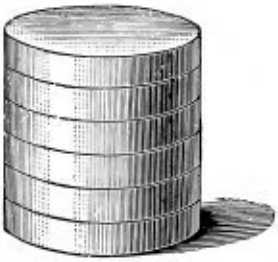


No. 2700.

Slate Ink Slab No. 2700 has a heavy Plate Glass Cover, with ground edges. The Plate Glass Cover fits air-tight. The best for rubbing Chinese ink.

No. 2700.	Slate Ink Slab, 2¾ in. square, with improved well	Each,	$0 35
2701.	" " " 3½ " " " " "	"	40

CHINA CABINET SAUCERS

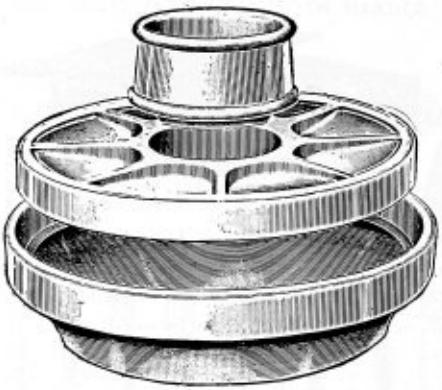


No. 2710.

No. 2710.	Nest of Cabinet Saucers, 6 in set, 2⅛ inches	Each,	$0 45
2711.	" " " 6 " 2⅝ "	"	55
2712.	" " " 6 " 3¼ "	"	65
2713.	" " " 6 " 3¾ "	"	75
2714.	" " " deep, 4 in set, 2⅝ inches	"	70
2715.	" " " " 4 " 3¼ "	"	80
2716.	" " " " 4 " 4¾ "	"	90

A "Nest of 6" consists of 5 saucers and cover; a "Nest of 4," of 3 saucers and cover.

CHINA COLOR DISHES

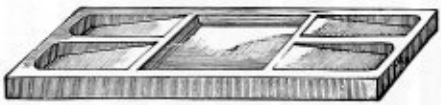


No. 2720.

No. 2720. Architects' Color slant and basin, 8 divisions and cup.....Each, $1 35

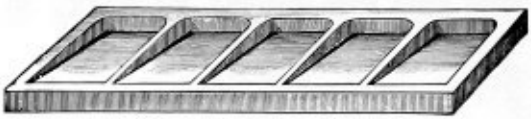
No. 2725.

No. 2725. Color Dish, 3 wells and 3 slopes, 2½ × 4 inches.....Each, $0 20
" " 5 " 5 " 4 × 7½ " ..... " 55



No. 2730.

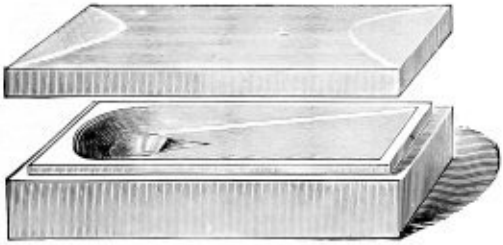
No. 2730. Color Slab, 4 slants and basin.....Each, $0 20



No. 2732.

No. 2732. Color Dish, 5 divisions, 3⅛ × 7⅞ inches.....Each, $0 35
2733. " " 6 " 3⅛ × 7¼ " ..... " 40
2734. " " 8 " 6 × 7⅞ " ..... " 50

CHINA INK SLABS



No. 2735.

No. 2736. China Ink Slab, with cover, 2¼ × 5½ inches ..... Each, $0 50

ARTISTS' WATER GLASSES

No. 2750.

No. 2750. Artists' Water Glass, 2¾ inches diameter ..... Each, $0 15
2751. " " " 3¼ " " ..... " 25
2752. " " " 3¾ " " ..... " 35

ARKANSAS OIL STONES

No. 2760.

No. 2763.

No. 2760.	Arkansas Oil Stone, wedge shape slip ..... Each,	$0 30
2761.	" " " " about $1\frac{1}{4} \times 3$ inches ..... "	50
2762.	" " " " $1\frac{1}{4} \times 4\frac{1}{2}$ " ..... "	90
2763.	" " " in case, with cover, 3 inches ..... "	75
2764.	" " " " " 5 " ..... "	2 00

ATOMIZER

No. 2770.

No. 2770. Atomizer, japanned tin, folding ..... Each, $0 15

FIXATIF

No. 2775.

No. 2775. Colorless Fixatif for Crayon or Charcoal.
Per 2-oz. bottle $0 25

No. 2776. Colorless Fixatif, for Crayon or Charcoal.
Per pint bottle 1 00

CHARCOAL IN STICKS

No. 2781.	Charcoal Sticks, fine, 50 in a box ..... Per box,	$0 15
2782.	" Conte's Venetian, 50 in a box ..... "	50
2783.	Rouget, Nos. 1, 2 and 3, 25 in a box ..... "	50

L. & C. HARDTMUTH'S KOH-I-NOOR PENCILS

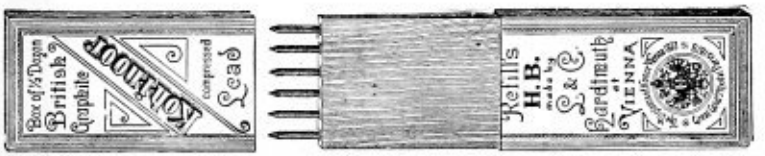
Universally Used Highest Awards

No. 2800

The Koh-i-noor Pencils are now so generally used that a description of their superior qualities would be superfluous. Suffice it to say that a Koh-i-noor pencil will outlast any other drawing pencil on the market, contains no grit and retains its point for a long line, the graphite, by a new process of manufacture, assuming a highly compressed form.

Koh-i-noor Pencils, Hexagon, Yellow Polish. In degrees as follows:

		Per dozen
No. 2800.	3B, 2B, B, HB, F, H, 2H, 3H, 4H, 5H, 6H, 7H, 8H, 9H	$1 25
2802.	4B	1 50
2804.	6B, 5B	1 80



No. 2806.

No. 2806. Koh-i-noor Leads, 6 in box, all grades, from 6B to 8H . . . . Per box, $0 60

No. 2808.

No. 2808. Koh-i-noor Artists' Pencil, with lead, double pointed . . . . . Each, $0 40
2810. " " " " " single " . . . . . " 30

L. & C. HARDTMUTH'S COPYING PENCILS

Universally Used Highest Awards

"Koh-i-noor Copying Ink Pencil"
made by L. & C. Hardtmuth at Vienna Austria
"KOH-I-NOOR" COPYING INK PENCIL Compressed Lead
L. & C. HARDTMUTH Austria
"MEPHISTO" COPYING PENCILS
No. 73B
HARDTMUTH IN AUSTRIA
No. 77. "Mephisto" "COPYING" MADE BY L. & C. HARDTMUTH IN AUSTRIA.
No. 73B HARD "Mephisto" COPYING MADE BY L. & C. HARDTMUTH IN AUSTRIA.

No. 2812. No. 2814. No. 2816. No. 2815.

No. 2812.	Koh-i-noor Copying Pencils, packed 1 dozen in box, violet	Per dozen,	$1 25
2814.	Mephisto (73B) Copying Pencils, in following colors: Violet, red, blue, green and black	"	60
2815.	Mephisto Copying Pencils (73B), Hard, violet	"	70
2816.	Mephisto (77), with red tips (the Conductor's Pencil)	"	70
2817.	Mephisto (77), Hard, with red tips (the Conductor's pencil)	"	70

L. & C. HARDTMUTH'S FAMOUS COLORED PENCILS

No. 2824.

51	Gamboge	64	Black	84	Scarlet
52	Orange Chrome	67	Sap Green	85	Vermilion
54	Olive Green	69	Emerald Green	86	Carmine
57	Raw Sienna	71	Light Green	87	Rose Madder
58	Venetian Red	75	Cobalt Blue	93	Purple
60	Vandyke	78	Dark Blue	94	Lemon Yellow
62	Burnt Sienna	80	Violet Carmine	95	Brown Blue

No. 2824. Hardtmuth's Wax Crayons, in wood . . . Per dozen, $1 00 Each, $0 10

No. 2825.

No. 2825.	Hardtmuth's Red Pencils, round			Per dozen,	$0 75
2826.	"	Blue "	"	"	75
2827.	"	Red and Blue Combination Pencils, round		"	75

No. 2829.

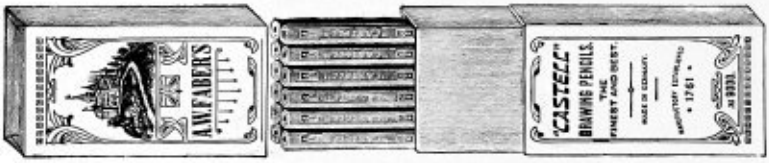
No. 2829. Koh-i-noor Pocket Pencil, 5½ inches long, HB only . . . . . Each, $0 45

No. 2830.

No. 2830.	Koh-i-noor Pocket Pencil, 4½ inches long, HB only		Each,	$0 35
2831.	"	Refills for Nos. 2829 and 2830. Per box of six	"	25

A. W. FABER'S PENCILS

CASTELL DRAWING PENCILS



No. 2835.

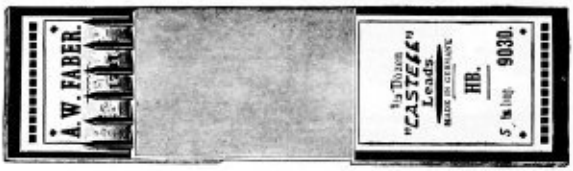
No. 2835. A. W. Faber's Castell Pencils, graded from 6B to 8H....Per dozen, $1 25

No. 2836.

No. 2836. A. W. Faber's Castell Pencils, flat HB and 2H, specially adapted for Field-book use.....Per dozen, $1 25

No. 2837.

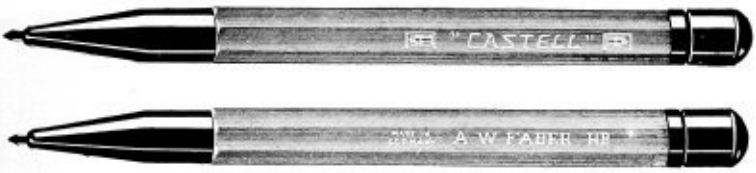
No. 2837. A. W. Faber's Castell Artists' Pencils, single pointed.....Each, $0 25
No. 2839. A. W. Faber's Castell Artists' Pencils, double pointed .....Each, 35



No. 2840.

No. 2840. A. W. Faber's Castell Leads, 2B–6H, for Artists' Pencils, one-half dozen in box.....Per box, $0 60

A. W. FABER'S PENCILS —Continued



No. 2841.

No. 2841. A. W. Faber's Castell Pocket Pencils, 5½ inches long, tip and point made of hard rubber.....Each, $0 40

2842. A. W. Faber's Castell Pocket Pencils, 4½ inches long, tip and point made of hard rubber..... " 35

No. 2844.

No. 2844. A. W. Faber's Castell Leads, HB, for pocket pencils, one-half dozen in box.....Per box, $0 30

No. 2845.

No. 2845. A. W. Faber's Pencil Lengthener.....Each, $0 10

No. 2846.

No. 2846. A. W. Faber's Castell Copying Pencil.
Each.....$0 10
Per dozen..... 1 00

No. 2847. A. W. Faber's Flat Castell Copying Pencil.
Each..... 10
Per dozen..... 1 00

A. W. FABER'S CASTELL POLYCHROME CRAYONS

No. 2851.

LIST OF COLORS

1	White	23	Cobalt Blue	45	Burnt Sienna
2	Chrome Yellow, Light	24	Ultramarine	46	Venetian Red
4	Chrome Yellow, Med.	26	Prussian Blue	49	Indian Red
5	Chrome Yellow, Dark	27	Indigo	50	Burnt Carmine
6	Yellow Ochre	29	Purple	51	Umber
9	Orange	30	Violet	53	Vandyke Brown
10	Chrome Green	31	Flesh Tint	54	Burnt Umber
11	Olive Green	35	Carmine	55	Sepia
12	Mineral Green	36	Scarlet	56	Burnt Sepia
13	French Green	39	Vermilion	58	Neutral Tint
16	Hooker's Green, No. 1	41	Sienna	59	Gray
17	Hooker's Green No. 2,	43	Burnt Ochre	60	Black
20	Prussian Green	44	Brown Ochre		

		Each	Per dozen
No. 2851.	A. W. Faber's Castell Polychrome Wax Crayons, colors listed above	$0 10	$1 00

No. 2852.

No. 2852. A. W. Faber's Polychrome Wax Crayons, assorted colors, one dozen in box ..... Per box, $1 00

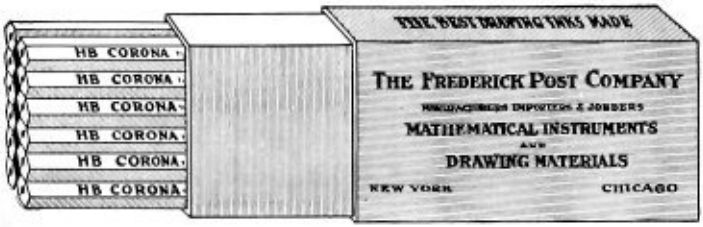
A. W. FABER'S COLORED OFFICE PENCILS

No. 2853.

No. 2853.	A. W. Faber's Red Pencils	Per dozen,	$0 75
2854.	" " Blue "	"	75
2855.	" " Green "	"	75
2856.	" " Yellow "	"	75

POST'S CORONA DRAWING PENCILS

Hexagon Yellow Finish



No. 2875.

These pencils are of very superior quality at a comparatively low price. They are uniformly graded, are free from grit, do not smear or soil the paper and will outlast any other pencil of the same cost. Made in the following degrees:

	Per Dozen	Per Gross
No. 2875. 2B, B, HB, F, H, 2H, 3H, 4H, 5H, 6H	$0 60	$6 00

F. P. CO. DETAIL DRAWING PENCIL

No. 2878.

Made in 4 degrees: No. 1 soft, No. 2 medium, No. 3 medium hard, No. 4 hard. Of excellent quality, a smooth writing and carefully graded pencil.

	Per Dozen	Per Gross
No. 2878. F. P. Co.'s Detail Drawing Pencil, Hexagon	$0 35	$3 50

F. P. CO. COPYING PENCILS

MADE IN GERMANY POST'S COPYING PENCIL
MADE IN GERMANY POST'S COPYING PENCIL
MADE IN GERMANY POST'S COPYING PENCIL
MADE IN GERMANY POST'S COPYING PENCIL

No. 2879.

No. 2879. **"Corona"** Copying Pencil. A very fine, smooth writing, hard copying Pencil.
Per dozen $0 60
Per Gross 7 00

No. 2880. **"Primo"** Copying Pencil. Best Quality.
Per Dozen 75
Per Gross 8 00

No. 2882. **"Primo"** Copying Pencil. Hard, Best Quality.
Per Dozen 75
Per Gross 8 00

POST'S SUPERIOR LUMBER AND METAL CRAYONS

No. 2885.

No. 2885. Post's Superior Lumber Crayons, Hexagon. Colors, red, blue and black.
Per Dozen $0 60
Per Gross 6 00

2886. Post's Superior Railroad and Metal Worker's Crayons, paper coated, square. $\frac{3}{8} \times \frac{3}{8} \times 4$ inches.
Per Dozen 40
Per Gross 4 00

2887. Same as No. 2885, but flat, $\frac{1}{4} \times \frac{1}{2} \times 4$ inches.
Per Dozen 25
Per Gross 2 50

2893. Red Kiel, in lumps.
Per pound 15

JOSEPH DIXON'S PENCILS AND CRAYONS

No. 2894.

No. 2894. Dixon's "Cabinet," Hexagon, gold stamped, rubber tipped.
Per dozen $0 50

No. 2895.

No. 2895. Dixon's Lumber Crayons, Hexagon; colors, red, blue and black.
Per dozen $1 20

No. 2896.

No. 2896. Dixon's Metal Workers' Crayon, paper coated.
Per dozen $0 50

E. FABER'S PENCILS

No. 2897.

No. 2897. E. Faber's "Star" Detail Pencils, graded from 1 to 5.
Per dozen $0 35

No. 2898.

No. 2898. E. Faber's Pencil Holders ..... Each, $0 05

No. 2899.

No. 2900.

No. 2899. E. Faber's Pencil Point Protector, hexagon, with rubber ..... Each, $0 05
2900. " " " " round taper point ..... " 05

POST'S PLIABLE RUBBER ERASERS

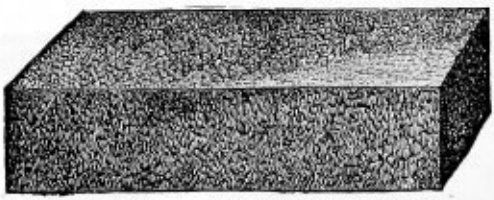
No. 2910.

No. 2910.	Post's Pliable "Crescent" Eraser.	Gray.						
No. 2911.	Post's Pliable "Crescent" Eraser.	Pink.						
	Pieces to the pound	40	30	20	12	8	4	
	Per piece	$0 05	07	10	15	25	50	
	Per pound							$2 00

F. P. POST CO. EAGLE CLEANERS

		No. 2922.	Each	Per dozen
No. 2913A.	Eagle Cleaner, small,	$1\frac{1}{8} \times 1\frac{1}{8} \times 1$	$0 05	$0 50
2913B.	" " medium,	$2\frac{1}{4} \times 1\frac{1}{8} \times 1\frac{1}{8}$	10	1 00
2913C.	" " large,	$3 \times 2 \times 1$	15	1 60

SPONGE RUBBER



No. 2915.

No. 2915.	Sponge Rubber, medium, rubber back, $2\frac{1}{4} \times 1\frac{3}{4} \times \frac{3}{4}$ inches	Each,	$0 30
2916.	" " large, $4 \times 2 \times 1$ inches	"	60
2917.	" " mammoth size, $6 \times 4 \times 1$ inches	"	1 80

POST'S CORONA AND NILE GREEN ERASERS

No. 2936.

No. 2937.

		Each	Per pound
No. 2936.	Post's Corona Erasers, 12 pieces to the pound	$0 20	$2 25
2936.	" " " 24 " " "	10	2 25
2936.	" " " 48 " " "	05	2 25
2936.	" " " 72 " " "	04	2 25
2937.	" Nile Green " 12 " " "	20	2 25
2937.	" " " 24 " " "	10	2 25
2937.	" " " 48 " " "	05	2 25

POST'S CARDINAL AND EMERAUDE ERASERS

For pencil erasing and cleaning

No. 2938.

		Each	Per dozen
No. 2938.	Post's Cardinal Red Eraser	$0 05	$0 50

No. 2939.

		Each	Per dozen
No. 2939.	Post's Emeraude Green Eraser	$0 05	$0 50

POST'S INK AND PENCIL ERASERS

No. 2940.

		Each	Per dozen
No. 2940.	Post's Ink and Pencil Eraser	$0 05	$0 50

POST'S CIRCULAR TYPEWRITER ERASERS

No. 2941.

	Are of Superior Quality; well adapted for ink and pencil.	Each	Per dozen
No. 2941.	Post's Circular Typewriter Eraser	$0 05	$0 50

POST'S TYPEWRITER ERASERS

No. 2942.

No. 2943.

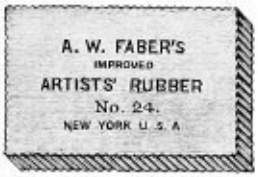
		Each	Per dozen
No. 2942.	Post's Typewriter Eraser, small	$0 05	$0 50
2943.	" " " large	10	1 00

No. 2944.

No. 2945.

		Each
No. 2944.	E. Faber's Kneaded Rubber, small	$0 05
2944½.	" " " large	10
2945.	" "Delta" Eraser	05

A. W. FABER'S ERASERS



No. 2949.

No. 2950.

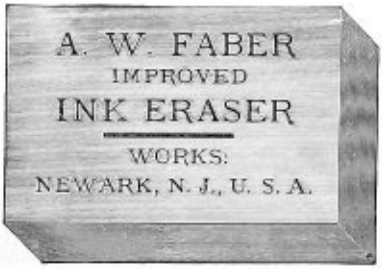
No. 2949. A. W. Faber's Improved Artists' Rubber.

Pieces to the pound..	40	30	24	20	16	12	8	4
Per piece.....	$0 06	08	10	12	15	20	25	50
Per pound.....								$1 80

		Medium	Large
No. 2950.	A. W. Faber's Ink and Pencil Eraser, in wood.....Each,	$0 15	$0 25

No. 2951.

No. 2951.	A. W. Faber's	Ink and Pencil Eraser, in pencil form.....Each,	$0 15
2952.	"	Ink Eraser, in pencil form..... "	15
2953.	"	Pencil Eraser, in pencil form..... "	15

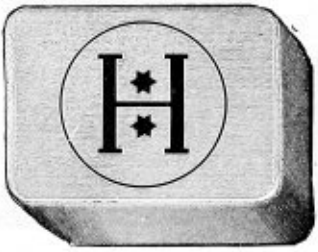


No. 2954.

No. 2955.

		Small	Medium	Large
No. 2955.	A. W. Faber's Ink Erasers.....Each,	$0 05	$0 10	$0 20
	Per 100.....	4 50	9 00	

L. & C. HARDTMUTH'S RUBBER ERASERS



Size 16. No. 2956.

No. 2956.	Hardtmuth's Pink Pliable Rubber.									
	Pieces to the pound.....	40	36	30	24	20	16	12	8	4
	Per piece.....	$0 08	09	10	13	15	20	25	40	75
	Per pound.....									$2 90
No. 2957.	Hardtmuth's Grey Pliable Rubber.									
	Pieces to the pound.....	40	36	30	24	20	16	12	8	4
	Per piece.....	$0 08	09	10	13	15	20	25	40	75
	Per pound.....									$2 90

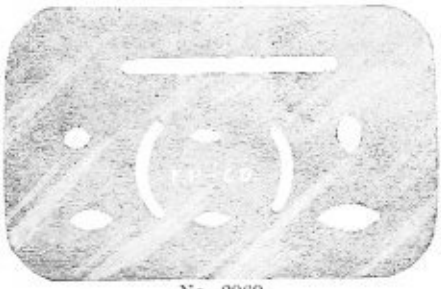
HARDTMUTH'S KOH-I-NOOR ERASERS

Size 16. No. 2958.

No. 2959.	Hardtmuth's "Koh-i-noor" Pink Pliable Rubber.									
	Pieces to the pound.....	40	36	30	24	20	16	12	8	4
	Per piece.....	$0 10	12	13	15	20	25	28	55	1 00
	Per pound.....									$4 00
No. 2959A.	Hardtmuth's "Koh-i-noor" Grey Pliable Rubber.									
	Pieces to the pound.....	40	36	30	24	20	16	12	8	4
	Per piece.....	$0 10	12	13	15	20	25	28	55	1 00
	Per pound.....									4 00

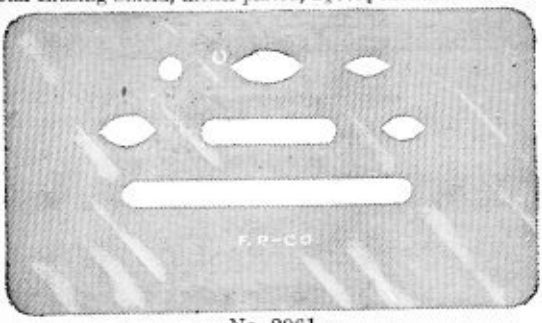
ERASING SHIELDS

For making erasures on drawings and typewriting.
Limited in size to hole in Shield



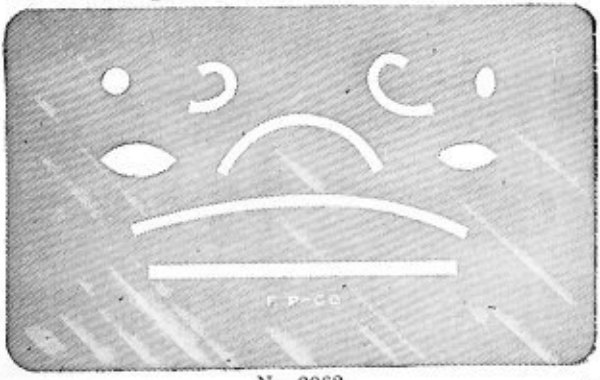
No. 2960.

No. 2960. Metal Erasing Shield, nickel-plated, $2\frac{3}{4} \times 3\frac{3}{4}$ inches.....Each, $0 20



No. 2961.

No. 2961. Celluloid Erasing Shield, transparent, $2\frac{1}{2} \times 4\frac{1}{2}$ inches.....Each, $0 20



No. 2962.

No. 2962. Celluloid Erasing Shield, transparent, 3×5 inches.....Each, $0 25

PENCIL POINTERS

No. 3000.

No. 3000.	Pencil Pointer, $1\frac{1}{4} \times 4$ inches, with handle	Each,	$0 10
3002.	" " $1\frac{1}{4} \times 4$ " without handle	"	10
3003.	Like No. 3000, but made of emery paper	"	20

These pencil pointers consist of a number of sheets of flint paper made into a block.

No. 3010.

No. 3010.	Steel Pencil Pointer, File and Tack Lifter, $7\frac{1}{2}$ inches	Each,	$0 25

STEEL ERASERS

No. 3012.

No. 3012.	Steel Eraser, cocoa handle, Imported	Each,	$0 35
3014.	" " " " Imported, fine finish	"	60
3016.	" " white bone handle, Imported	"	75

No. 3020.

No. 3020.	Steel Eraser, cocoa handle, Imported	Each,	$0 45
3021.	" " ebony " "	"	70
3023.	" " white bone handle, Imported	"	90

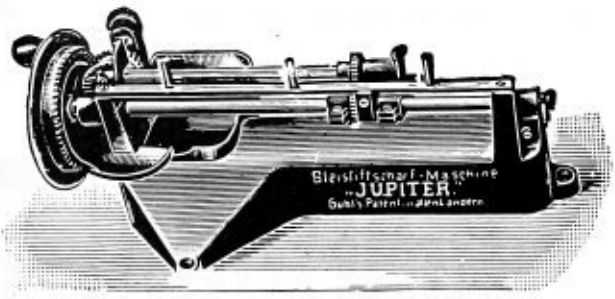
PENCIL SHARPENERS

No. 3029.

No. 3030.

No. 3029. The **"Lakeside"** Pencil Sharpener; cutter of case hardened steel, automatically holds pencil in place, requiring but one hand to operate; mechanically perfect ..... Each, $5 50
3030. Planetary Pencil Pointer ..... " 4 50
3031. Extra Knives for Planetary Pencil Pointer ..... Pair, 65

The Planetary Pencil Pointer is very durable and easily operated. It makes perfect points on any kind of pencil, can be attached to either wall or table.



No. 3032.

No. 3032. "Jupiter" Pencil Sharpener ..... Each, $8 50
3033. New Cutting Wheel ..... " 1 50

The "Jupiter" Pencil Sharpener excels all others in workmanship and the ease with which it can be operated. The cutting wheel is made reversible, so that when one side is dull, the other can be used, after which a new cutting wheel can be furnished or the old one can be sharpened.

STEEL PENS

FOR DRAUGHTING USE

No. 3083.

No. 3085

No. 3082.

No. 3087.

No. 3081.

No. 3088.

No. 3091.

No. 3089.

			Per Dozen	Per Gross
No. 3081.	Gillott's Crow Quill Pens, (850) Long Shoulder, on cards		$0 75	$ 7 50
3082.	" Drawing " (1000) Superfine, on cards		1 10	12 00
3083.	" Lithographic" (290) on cards with holder		60	6 00
3084.	" " " (290) loose, in gross boxes		50	5 00
3085.	" Mapping.. " (291) on cards, with holder		60	6 00
3086.	" " " (291) loose, in gross boxes		50	5 00
3087.	" " " (170) " " "		10	1 00
3088.	" " " (303) " " "		15	1 40
3089.	" " " (404) " " "		10	1 00
3090.	French Crow Quill Pens, on cards, with holders		35	3 60

(About ⅔ Actual Size.)

No. 3091.

			Per Dozen	Per Gross
No. 3091.	Gillott's Crow Quill Pens (659), on card, with holder		$0 60	$6 00
3091A.	" " " " (659), in ¼-gross boxes		50	5 00

For pen holders see page 303

F. P. CO.'S DRAWING PENS —Continued

No. 3094.

No. 3094. F. P. Co.'s Crow Quill Pens, with improved holder with cork finger piece, card of 12 pens ..... Per card, $1 00

PENHOLDERS

No. 3095.

		Each	Per dozen
No. 3095.	Improved Crow Quill Penholder, without pen	$0 05	$0 50

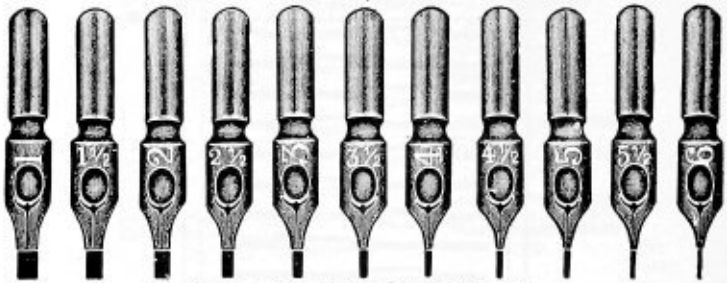
A holder for Crow Quill Pens of the thickness of an ordinary penholder.

No. 3096.

		Each	Per dozen
No. 3096.	Penholder, polished handle	$0 05	$0 50
3097.	" cork tip	05	60
3098.	" for Crow Quill Pens, wood	05	50
3099.	" " " " " ebony	10	1 00

Round Writing Pens

FOR LETTERING PLANS, MAPS AND DRAWINGS



Single Pointed Pens, Nos. 3107–3109.

No. 3107. Single Pointed Pens.....Per ¼ gross of any one size, $0 25
3108. " " " .....Per gross of any one size, 75
3109. Assortment of 12 Single Pointed Pens, on card.....Per card, 10

Double Pointed Pens, No. 3110.

No. 3110. Double Pointed Pens, 12 kinds on card, with holder.....Per card, $0 25
3111. Assortment of Single and Double Pointed Pens, 25 in box. Per box, 40
3111½. Double Pointed Pens.....Per ¼ gross, 65
3111C. Ink Holders for Single Pens.....Per box of 6, 10
" " " " " .....Each, 10

PENHOLDER FOR ROUND WRITING PENS

Single or Double

No. 3111D.

No. 3111D. Penholder for Round Writing Pens.....Each, $0 10

For Alphabet Books and for lettering working drawings, see page 411

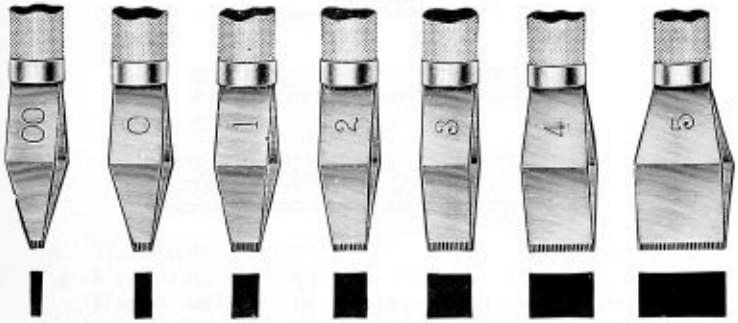
Automatic Shading and Marking Pens

No. 3112.

No. 3112. Automatic Shading Pens, 0 1 2 3 4 5
Width of nib.....$\frac{1}{16}$ $\frac{1}{8}$ $\frac{3}{16}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ inch.....Each, $0 20

AUTOMATIC MARKING PENS

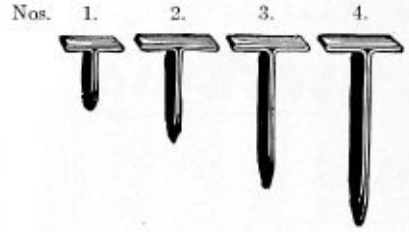
No. 3113.



No. 3113. Automatic Marking Pens, 00 0 1 2 3 4 5
Width of nib.....$\frac{1}{16}$ $\frac{3}{32}$ $\frac{1}{8}$ $\frac{3}{16}$ $\frac{1}{4}$ $\frac{3}{8}$ $\frac{1}{2}$ inch.....Each, $0 20

For Alphabet Books and Lettering, Markings, Drawings, see page 411

BRASS PAPER FASTENERS



No. 3150.

No. 3155.

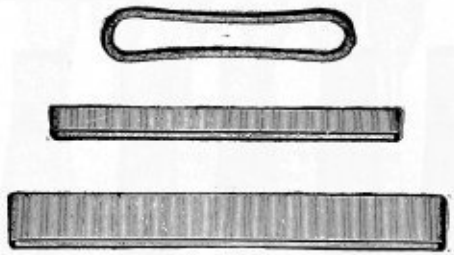
No. 3150. Paper Fasteners, flat heads.

Number	1	2	3	4	5	6
Length, inches	¼	½	¾	1	1¼	1½
Per box of 100	$0 15	20	25	30	60	75
" 1,000	1 00	1 25	1 50	1 75	5 00	6 00

3155. Paper Fasteners, round heads.

Number	1	2	3	4	5	6
Length, inches	¼	½	¾	1	1¼	1½
Per box of 100	$0 20	25	30	40	75	85
" 1,000	1 25	1 50	2 00	2 50	7 00	8 00

BEST RUBBER BANDS



No. 3156.

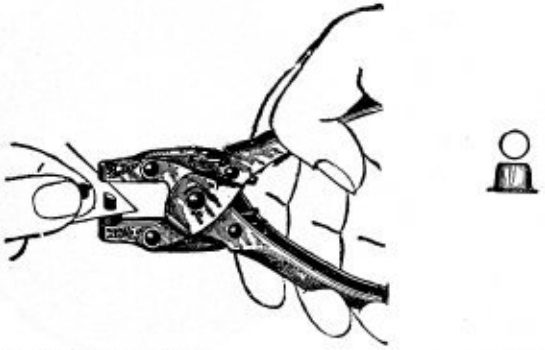
No. 3156. Rubber Bands.

Length	1	1¼	1½	2	2½	3	3½
Width, 1/16 in. Per gross,	$0 15	20	25	30	35	....	....
" ⅛ " "	40	50	55	60	70	80	90
" ¼ " "	....	..	..	90	1 10	1 25	1 50

Rubber Bands, 1 gross assorted sizes, No. 300 . . . . . Per Gross, $0 65
" " 1 " " " " 400 . . . . . " 35

STAPLE AND EYELET PRESSES

No. 3157. Staple Press for Binding, ... Each, $4 50
3157A. " " " " with short arm ..... " 2 50
3157B. Wire Staples, No. 1 or 2 ..... Per 1,000, 60



No. 3158. Eyelet Press and Punch ..... Each, $1 50
3158A. Eyelets ..... Per box of 250, 40

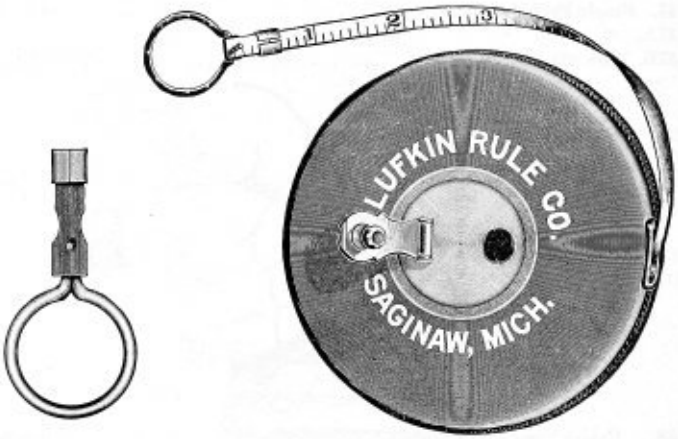
No. 3159. The "Standard" Eyelet Press and Punch, made of metal, nickel-plated, is greatly superior to any of its kind. The "gauge" is a new feature of great utility and all the obnoxious breakage of springs, etc., which continually occurs in other eyelet punches, is impossible in the "Standard" ..... Each, $3 00

No. 3159A. Eyelets	Sizes B	J. N.	D. B. long	D. B. short
Per box of 250	$0 15	40	20	40

STEEL MEASURING TAPES

ENGINEERS' PATTERN

These steel tapes are made of the best grade of steel obtainable for this purpose, uniform in quality and evenly tempered. They are superior to any other make in material, accuracy and workmanship. They are graduated with the utmost care as to accuracy in accordance with the U. S. Standard furnished by the National Bureau of Standards in Washington, D. C., and we can guarantee them to be as perfect in accuracy as they can be made.



No. 3200.

Engineers' Steel Tape, in hard Leather Steel-lined Case, nickel-plated trimmings, with two detachable rings. The tape can be readily detached from the case and we furnish an extra ring for the other end. The steel is heavier and stronger than used in the regular steel tapes and the cases are thinner.

Engineers' Steel Tape, in case, steel ribbon ¼-inch wide, flush handle, graduation beginning at the end of the line.

		50 ft.	75 ft.	100 ft.
No. 3200.	Divided in 10ths	$6 00	$ 9 50	$12 00
3201.	" 12ths	6 00	9 50	12 00
3202.	" 10ths and links	6 50	10 25	13 00
3203.	" 12ths "	6 50	10 25	13 00
	Meters	15	25	30
No. 3205.	Divided in metric measurement	$6 00	$9 50	12 00

STEEL MEASURING TAPES —Continued

"RELIABLE"

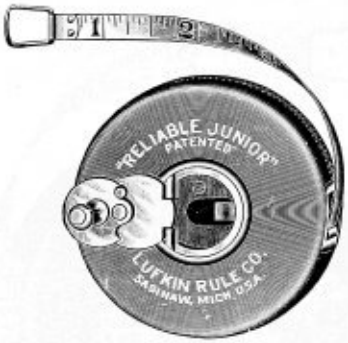
No. 3210.

"Reliable" Steel Tapes in hard Leather Cases, with double folding flush handles opened by pressing on opposite side, nickel-plated trimmings, measurements guaranteed to be accurate; $\frac{3}{8}$-inch steel ribbon. Graduations begin at end of line.

	Length, in feet	25	33	50	66	75	100
	Diameter, in inches	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{1}{2}$
No. 3210.	Divided in 10ths and links. Each,	$4 50	5 20	7 20	9 20	10 40	12 80
3211.	" 12ths " . "	4 50	5 20	7 20	9 20	10 40	12 80
3212.	" 12ths and metric measure..... "	4 85	5 70	7 95	10 20	11 50	14 30

STEEL MEASURING TAPES —Continued

THE "RELIABLE" JUNIOR



No. 3220.

The "Reliable Junior" Steel Tape is an exact counterpart of the "Reliable," but only about one-half its size and weight. It is an excellent piece of workmanship and, although small and light, the steel is of sufficient weight and it is constructed in such a careful manner that with proper care it will wear as long as an ordinary steel tape. Fully guaranteed as to accuracy and construction.

With flush folding handle, in hard leather case, and with nickel-plated trimmings, with ¼-inch tape.

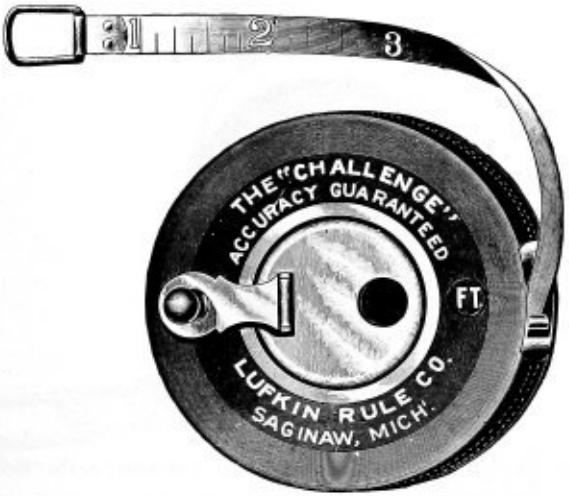
The "Reliable Junior" is a very convenient vest pocket tape, as the 25 feet tapes weigh only three ounces; the 50 feet tapes five ounces, complete, and longer tapes in proportion.

	Length, in feet		25	50	100
No. 3220.	Divided in 10ths and feet	Each,	$3 75	$4 60	$7 00
3221.	" 12ths "	"	3 75	4 60	7 00
3222.	" metric measure, one side	"	3 75	4 60	7 00

Other lengths made to order

STEEL MEASURING TAPES —Continued

THE "CHALLENGE"



No. 3228.

The "Challenge" Steel Tapes, although somewhat lower in price than other steel tapes, are of unusual merit. They are of perfect workmanship and absolutely accurate and can be safely relied on to give satisfaction in every particular.

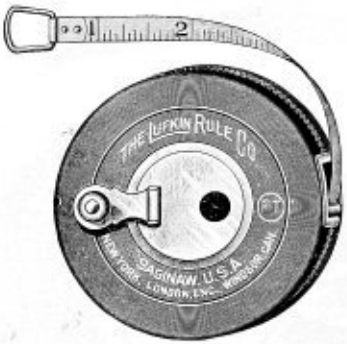
"Challenge" Steel Measuring Tapes in hard leather cases, with flush handles and nickel-plated trimmings, $\frac{3}{8}$-inch steel ribbon, divided on one side only.

	Length, in feet	25	33	50	66	75	100
	Diameter, in inches	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{1}{2}$
No. 3228.	Divided in 10ths and feet...Each,	$3 25	3 50	4 00	5 00	5 25	6 75
3228A.	" 12ths " ... "	3 25	3 50	4 00	5 00	5 25	6 75

	Length, in meters	10	15	20	25	30
No. 3229.	Divided in metric measure, first 10 centimeters in millimeters.....Each,	$3 50	4 00	5 00	6 00	6 75

STEEL MEASURING TAPES —Continued

THE "CHALLENGE JUNIOR"



No. 3230.

The "Challenge Junior" Steel Tape compares with the "Challenge" as the "Reliable" with the "Reliable Junior." It is a smaller and lighter tape of the same type. While very light and compact, yet it is constructed in a very durable manner. The measurements are guaranteed to be perfectly accurate. The 25 feet tape weighs only three ounces and the 50 feet tape only five ounces, complete, and it will prove specially attractive to those who desire a tape for light work, which can conveniently be carried in the pocket.

"Challenge Junior" Tapes, in hard leather cases, with flush handles, nickel-plated trimmings, divided one side only, with ¼-inch tape.

	Diameter, in inches		2¼	2⅜	3¼
	Length, in feet		25	50	100
No. 3230.	Divided in 10ths and feet	Each,	$3 00	3 50	5 75
3231.	" 12ths "	"	3 00	3 50	5 75
3233.	" metric on one side and feet on other	"	3 50	4 50	6 75
3234.	" 10ths on one side, 12ths on other	"	3 50	4 50	6 75

STEEL MEASURING TAPES —Continued

F. P. Co. "PRIMO" STEEL TAPES

In Leather Cases

No. 3235.

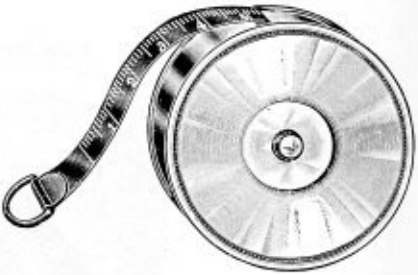
The "Primo" Steel Tapes are of superior quality made of the best grade steel. Graduations are accurate. Tape ⅜-inches wide, in hard leather case, flush handle.

	Length, in feet	25	50	75	100
No. 3235.	Feet in 10ths, Each,	$3 85	5 25	7 30	9 00
3236.	" 12ths, "	3 85	5 25	7 30	9 00
	Length, in meters	10	15	20	25
No. 3237.	Metric, Each,	$4 25	5 50	6 50	7 50

STEEL MEASURING TAPES —Continued

STANDARD POCKET STEEL TAPES

No. 3238.



No. 3239.

German Silver cases, spring wind and stop, steel ribbons ¼-inch wide.

	Feet	3	5	6	9	12
No. 3238.	Pocket Steel Tapes, divided 16ths and meters ... Each,	$1 10	1 40	1 60	2 20	2 80
3239.	Same as No. 3238 with stop in center ... "	0 75	1 00	1 25	2 00	2 25
	Feet	3		6		9
3240.	Pocket Steel Tapes, divided 10ths and 16ths. Each,	$1 30		1 90		3 00
	Feet	1½				3
3241.	Steel Tape, 5-32 inch wide, German Silver Case, with spring and stop, divided in $\frac{1}{16}$ inches and meters ... Each,	$0 60				85

No. 3242. Pocket Steel Tape, 5-16 inches wide, 2¼ inches diameter, German Silver cases, with spring wind and stop, divided 10ths or 12ths, 25 feet long ... Each, $3 60

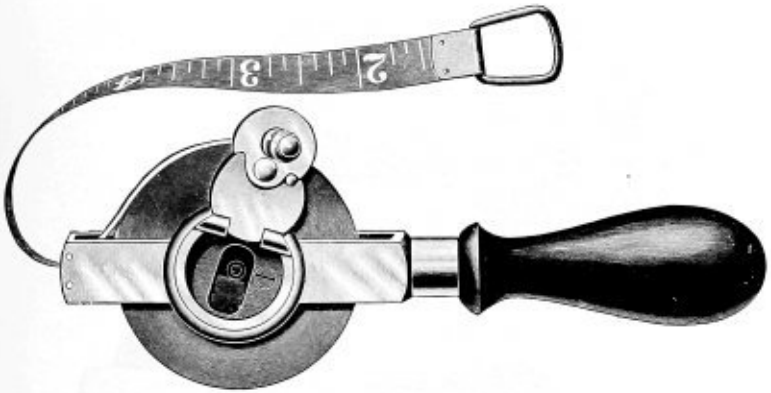
3243. Same as No. 3242, but divided 10ths and 12ths, 25 feet long ... " 4 00

STANDARD POCKET LINEN TAPES

	Feet	3	6
No. 3244.	Pocket Linen Tapes, divided 16ths and meters ... Each,	$0 80	1 00

STEEL MEASURING TAPES —Continued

THE "RELIABLE"



No. 3245.

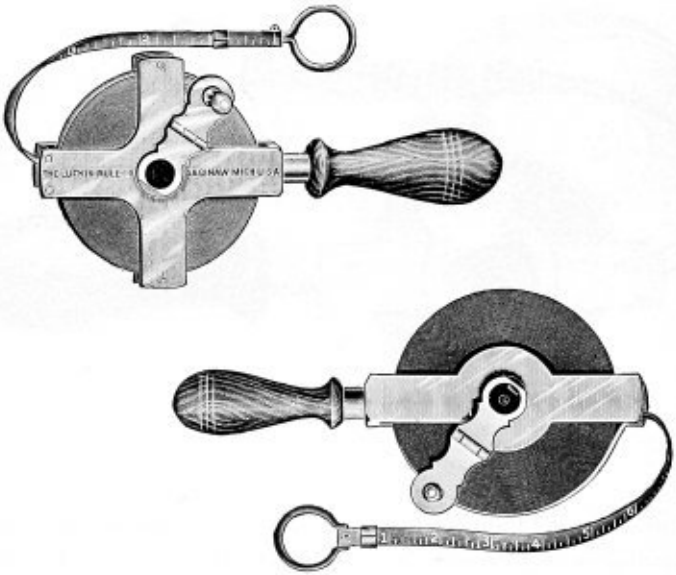
"Reliable" Steel Frame Tapes, in nickel-plated brass frame, with patent folding flush handles, opened by pressing small pin on other side; with steel ribbon one-half inch. Graduations beginning at end of line.

	Length, in feet	33	50	66	75	100
No. 3245.	Divided in 10ths and 100ths ..... Each,	$6 50	7 50	9 50	11 50	13 50
3246.	" 12ths " 8ths ..... "	6 50	7 50	9 50	11 50	13 50
3247.	" feet on one side, metric on other ..... Each,	7 00	8 25	10 50	12 65	15 00
3248.	Divided in 10ths on one side, 12ths on other ..... Each,	7 85	9 50	12 00	14 50	17 50

	Length, in meters	10	15	20	25	30
No. 3249.	Divided metric measure, first 10 centimeters in millimeters ..... Each,	$6 50	7 50	9 50	11 50	13 50

STEEL MEASURING TAPES —Continued

ENGINEER'S PATTERN



No. 3250.

Four-Arm Frames for 100 feet and longer Tapes

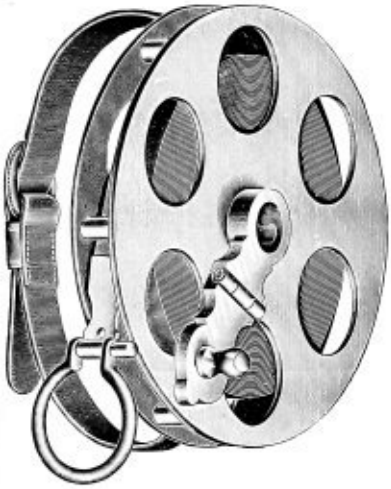
Engineers' Pattern Frame Steel Tapes, with two detachable rings and folding, winding handles. Frames and trimmings nicely nickel-plated. With strong one-quarter inch steel ribbon. The tape can be readily detached from the frame and an extra ring is furnished for the other end of the tape.

	Length, in feet	33	50	66	75	100	200
No. 3250.	Divided in 10ths, Each,	$4 25	5 25	6 25	7 50	9 00	17 50
3251.	" 12ths, "	4 25	5 25	6 25	7 50	9 00	17 50
	Length, in meters	10	15	20	25	30	
No. 3254.	Divided in metric measure, first 10 centimeters in millimeters, Each,	$4 25	5 25	6 25	8 00	9 00	

Other lengths and divisions made to order.

STEEL MEASURING TAPES —Continued

THE "WOLVERINE"



No. 3265.

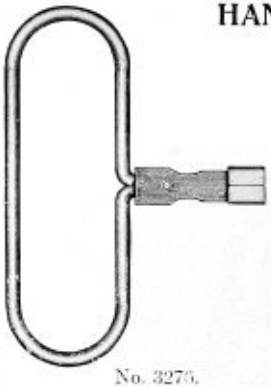
"Wolverine" Steel Tape with open aluminum reel, with nickel-plated brass folding handle. Leather strap on the reverse side, by which the tape can be firmly held while winding. Extremely light and convenient, the 100-ft. reel weighing but 8 ounces complete, yet sufficiently strong and durable to withstand the most severe usage. The aluminum is given a satin finish, which presents a beautiful appearance.

With **one-quarter-inch** Engineers' Pattern Tapes, which can be readily detached from the reel. Two detachable rings furnished.

	Length, in feet		50	66	75	100
	Diameter of reel, in inches		4⅜	4⅜	4⅝	5¼
No. 3265.	Divided in 10ths	Each,	$7 00	8 50	9 50	12 00
3266.	" 12ths	"	7 00	8 50	9 50	12 00
3267.	" 10ths and links	"	7 75	9 50	10 65	13 50
3268.	" 12ths. "	"	7 75	9 50	10 65	13 50
	Length, in meters		15	20	25	30
3270.	Divided in metric measure	Each,	$7 00	8 50	10 25	12 00

Other lengths and graduations made to order

HANDLES FOR STEEL TAPES



No. 3275.

DETACHABLE RINGS FOR ENGINEERS' PATTERN TAPES

Two one-inch round detachable rings are furnished with each Engineer's Pattern Tape.

EXTRA DETACHABLE RINGS OR HANDLES

No. 3275. 1-inch, round. Per pair, $0 50
3276. 3-inch, oval.. " 1 00

No. 3275.

CLAMP HANDLES

For attaching to any part of a long steel tape, thus enabling one to adapt it to any desired length. Brass, nicely nickel-plated.

No. 3277.....Each, $0 75

No. 3277.

No. 3279.

TENSION HANDLES

For applying the exact tension at which a steel tape is standard. Brass, nickel-plated.

No. 3278. Indicating tension up to 20 pounds by half pounds.....Each, $2 50

PLUMB BOB ATTACHMENT FOR STEEL TAPES

These are used in oil fields for gauging oil in tanks, and this attachment is included in the measurement of the tapes. The Plumb Bobs are nickel plated and provided with a detachable clip for fastening to the tape.

No. 3279. No. 3279.....Each, $1 10

No. 3278.

"PRIMO" METALLIC MEASURING TAPES

IN LEATHER CASES

No. 3310.

The "Primo" Metallic Tapes are made of best grade wire interwoven Linen Thread, coated with a waterproof sizing to protect the surface and to prevent stretching. Hard Leather Cases, Brass Trimmings.

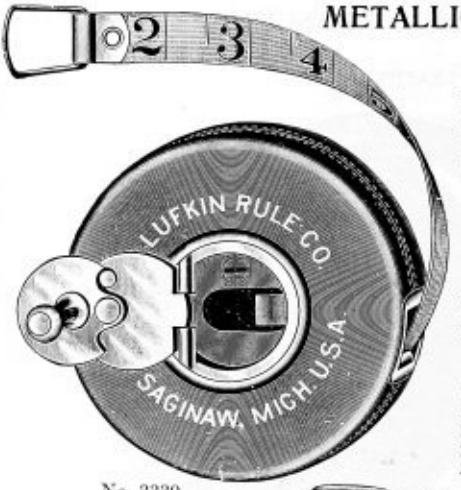
	Length, in feet	25	50	75	100
No. 3310.	"Primo" Metallic Tape, feet in 10ths . Each,	$1 70	2 35	3 25	3 80
3312.	" " " " 12ths "	1 70	2 35	3 25	3 80
3314.	" " " " 10ths and links "	1 80	2 50	3 30	4 20
3316.	"Primo" Metallic Tape, feet in 12ths and links "	1 80	2 50	3 30	4 20
	Meters	10	15	20	25	30
3318.	"Primo" Metallic Tape, Metric. Each	$2 00	2 50	3 00	3 50	4 00

Tape Lines Only

	Feet	25	50	75	100
3319.	"Primo" Metallic Tape, feet in 10ths . Each,	$0 70	1 25	1 75	2 50
3320.	" " " " 12ths "	70	1 25	1 75	2 50
	Meters	10	15	20	25	30
3322.	"Primo" Metallic Tapes, Metric, 12ths . . . . . Each,	$0 80	1 20	1 60	2 00	2 40

METALLIC MEASURING TAPES

—Continued



No. 3330.

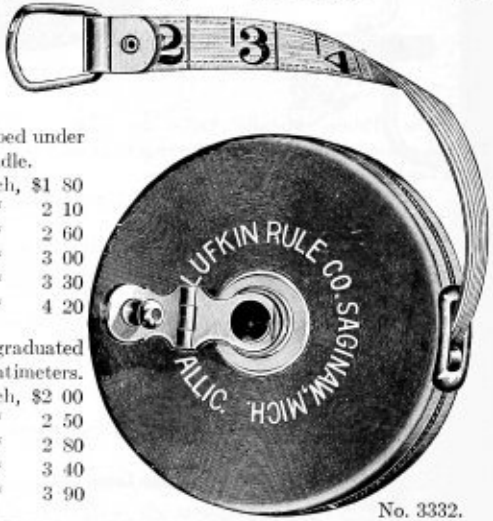
Tape of best woven shrunk linen, ½-inch wide, with metal warp, hard leather case, double folding flush handle, metal trimmings, graduated in 10ths and 12ths.

No. 3330.

25 feet	Each,		$2 10
33 "	"		2 40
50 "	"		2 90
66 "	"		3 30
75 "	"		3 60
100 "	"		4 50

No. 3331. Same as No. 3330, graduated in meters and centimeters.

10 meters	Each,		$2 30
15 "	"		2 80
20 "	"		3 10
25 "	"		3 70
30 "	"		4 20



No. 3332.

No. 3332. Same tape as described under 3330, with plain handle.

25 feet	Each,		$1 80
33 "	"		2 10
50 "	"		2 60
66 "	"		3 00
75 "	"		3 30
100 "	"		4 20

No. 3333. Same as No. 3332, graduated in meters and centimeters.

10 meters	Each,		$2 00
15 "	"		2 50
20 "	"		2 80
25 "	"		3 40
30 "	"		3 90

METALLIC TAPES WITHOUT CASES

	Length, feet	25	33	50	66	75	100
No. 3340.	Marked one side, Each,	$0 80	1 00	1 40	1 60	1 80	2 60
3341.	" both sides, "	90	1 10	1 50	1 80	2 00	2 90
3342.	Length, meters		10	15	20	25	30
	Each, Each,		$1 00	1 40	1 60	2 10	2 60

CHESTERMAN'S MEASURING TAPES

No. 3345.

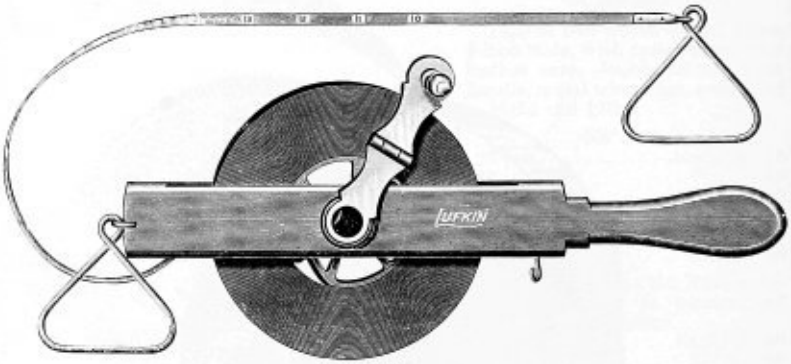
Chesterman's Metallic Tapes, Red Leather Case, ⅜-inch wide, wire woven or metallic, folding handle. Graduations begin at end of ring.

		Feet,	25	50	75	100
No. 3345.	Divided 10ths of feet and links	Each,	$1 80	2 60	3 30	4 20
3346.	" 12ths " "	"	1 80	2 60	3 30	4 20

Chesterman's Metallic Tapes, without case.

		Feet,	25	50	100
No. 3347.	Divided 10ths of feet and links	Each,	$1 00	1 50	2 90
3348.	" 12ths " "	"	1 00	1 50	2 90

IMPROVED SURVEYORS' CHAIN TAPES



No. 3360.

Sample of tape, showing graduations

With heavy ¼-inch steel tapes, nicely finished hardwood reel, with large metal folding handle and two detachable rings, trimmings nicely nickel-plated. Graduated every foot, the end feet in tenths and twelfths. **Unless otherwise ordered,** these tapes will be furnished with end feet graduated to tenths. This article is something new in the way of chain tapes or band chains and is far superior to anything ever put on the market in this line.

These graduations are made on a bright metal, raised, well-tempered surface, figures etched in (rivets tending to weaken a tape).

The frame and winding apparatus is strong, durable and compact, the tape is easily detachable and provided with two large and strong detachable handles or rings.

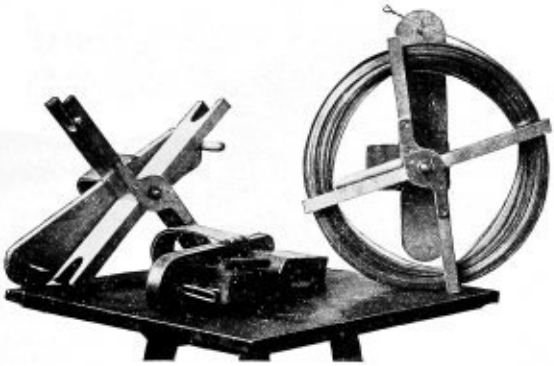
When the tape is not in use these handles are fastened to the frame where they will not get lost, and offer at the same time a convenient handle for carrying the complete tape.

Each tape is packed one in a box and we guarantee it in every way.

Prices:

		Feet..	100	200	300
No. 3360.	Improved Surveyors' Chain Tapes, complete. Each		$6 00	9 00	12 50
3361.	Tape only, with two rings	Each,	4 00	7 00	10 50
3362.	Plain Reel only	"	....	....	2 00
3363.	Pair of rings or handle	Per pair,	....	....	50

CHICAGO STEEL TAPES



No. 3369.

Chicago Steel Tapes with wooden reels, specially adapted for long tapes and tapes with shoulders.

Sample of tape showing graduations

These tapes are made of the best quality of flexible steel ribbons, carefully and finely tempered to prevent kinking. The Chicago Steel Tape will throw itself out of a kink unless held so that it cannot free itself and then it can only be broken by vicious jerking. The tapes are practically indestructible. A heavy locomotive and train running over one would break it about once in a thousand times.

These tapes are made of the standard width, $\frac{5}{16}$ inches, as it has been found by experience that this is the best width for the purpose. We have them, however, also $\frac{1}{2}$ inch wide, if preferred.

They are plainly divided at every foot, link, meter or vara, with the end divisions in 10ths. The divisions are made on solder, so as to be legible, should the tape become rusty through usage (see above illustration).

The Chicago Tapes are made under a 10-pound strain at a temperature of 70° Fahrenheit. They are made to stand rough usage and to take the place of the old time chains, since they are more accurate, neater, lighter and will not get out of shape.

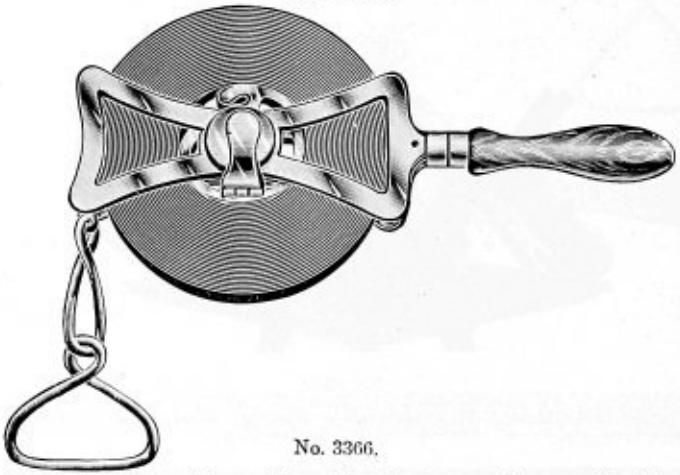
We fully guarantee the Chicago Steel Tape. Any tape, which is not absolutely correct in its graduation or numbering, or which is indistinctly marked, or breaks, due to a flaw in the steel or due to workmanship, we shall replace with a new tape. If broken by a train on an open track we shall also replace it with a new tape.

Tapes with shoulders, 25 cents extra. Tapes marked on both sides 1 cent per mark extra.

Rawhide or metallic handles are furnished with the tape without extra charge.

CHICAGO STEEL TAPES -Continued

$\frac{5}{16}$-inch wide



No. 3366.

Chicago Steel Tape with metallic reel, for short tapes and tapes without shoulders

Graduation beginning at end of Steel Ribbon	Graduation beginning 6 in. from end of Steel Ribbon	Length	Without Reel	With Wooden Reel	With Metallic Reel
			Each	Each	Each
3365	3365A	50 feet	$ 3 00	$ 3 75	$ 4 25
3366	3366A	100 "	3 75	4 50	5 00
3367	3367A	200 "	6 00	6 75	9 00
3368	3368A	300 "	8 00	9 50	12 00
3369	3369A	500 "	13 00	14 50	18 00
3370	3370A	100 link	3 00	3 75	4 25
3371	3371A	200 "	5 00	5 75	7 00
3372	3372A	20 vara	3 00	3 75	4 25
3373	3373A	40 "	5 00	5 75	7 00
3374	3374A	50 "	6 00	6 75	9 00
3375	3375A	20 meter	3 00	3 75	4 25
3376	3376A	40 "	5 00	5 75	7 00

For tapes with shoulders add 25 cents to each tape.

For tapes marked both sides add 1 cent per mark.

Metallic Reel not furnished for tapes with shoulders.

Three-sixteenths inch wide tape furnished, if specified, at same price as above, but no metallic reel furnished for the three-sixteenths inch tape longer than 200 feet.

All tapes 100 feet or over are furnished with four arm handles. See illustration, other page.

TAPE REPAIR OUTFITS

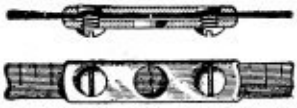
No. 3380.

The "Punch and Riveter" set for Repairing Steel Tapes. Five minutes only required to mend an ordinary break.

Can be carried in instrument box, thus enabling an engineering corps to repair their broken tapes in the field with the loss of a few minutes' time. Cuts a clean hole through two thicknesses of steel tape without drawing the temper. No filing required, holes can be cut near the extreme edge without splitting the tape, thus avoiding any chance of dirt collecting under the splice, cutting the fingers when drawing tape through the hands, or catching in rags when cleaning, etc.

No. 3380. Punch and Riveter Outfit, complete $4 50

3381. Extra eyelets for outfit furnished 1,000 in package, two lengths. Per thousand 1.25

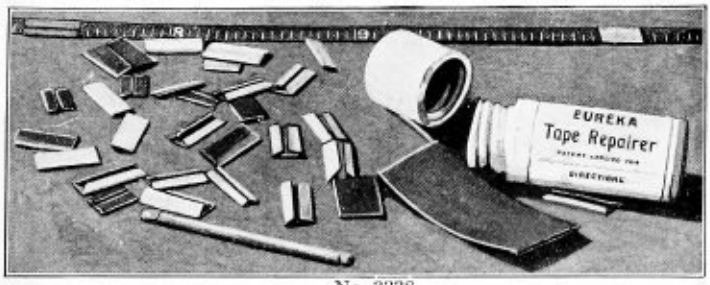


No. 3382.

No. 3382. Little Giant Tape Splice, for ¼, ½, ¾, 1 inch Tapes ..... Each, $0 35

To repair breaks, insert broken ends; adjust by sight hole and turn down screws. Will not catch on obstructions and will withstand the strongest pull.

In ordering, please mention size wanted.



No. 3338.

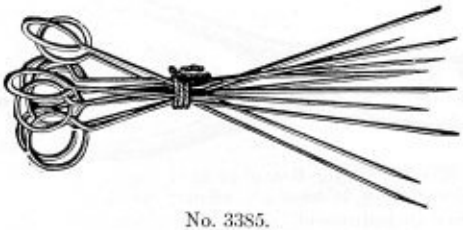
No. 3383. "Eureka" Tape Splice ..... Per dozen sleeves, $0 50

This splice consists of a thin sheet of metal folded in the shape of a sleeve and coated with a combination of solder and flux so sensitive, that the head of a common lighted match will bring about a perfect adhesion between tape and sleeve. The repair can be made in the field in a minute and look as neat as if done by a jeweler and as strong as a blacksmith could do it. No rivets or soldering irons required.

Sleeves are furnished one dozen in a small wooden box with directions.

In ordering state width of Tape.

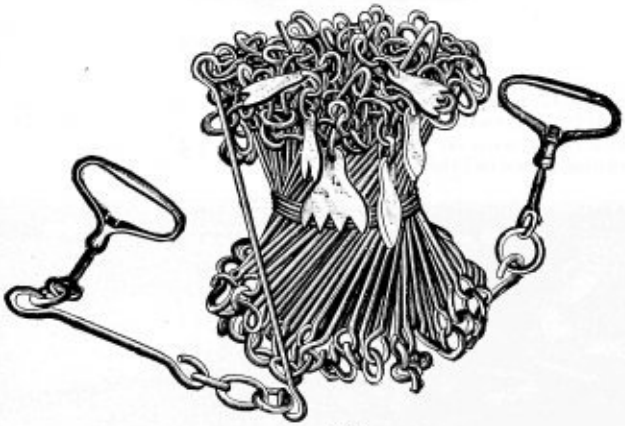
ARROWS



No. 3385.

No. 3385.	Steel Arrows, W. G. 6, 11 in set, 14 inches long..... Per set,	$1 50
3386.	" " " 9 " 9 " " ..... "	1 00

STEEL CHAINS



No. 3390.

No. 3390.	Surveyors' Steel Chains, brazed links and rings, W. G. 12, brass handles.			
	Feet..... 33	66	50	100
	Each.....$5 50	10 00	6 00	11 50
3391.	Steel Metric Chains, brazed links and rings, W. G. 12, with brass handles.			
	Meter..... 10	15	20	25
	Each.....$5 50	7 50	10 00	12 50

PLUMB BOBS

No. 3400.

No. 3401.

No. 3406.

No. 3408.

No. 3400.	Brass, Steel Pointed, weight 6 ounces	Each,	$1 25
3401.	" " " " 8 "	"	1 50
3402.	" " " " 10 "	"	1 65
3403.	" " " " 12 "	"	1 80
3404.	" " " " 14 "	"	2 00
3405.	" " " " 16 "	"	2 25
3406.	" " " " 10 " with concealed reel, held by friction in any position	"	2 50

CHICAGO PLUMB BOBS

Brass, highly finished, with removable steel points and screw caps.

No. 3408.	Chicago Plumb Bob, 2 ounces	Each,	$0 55	Dozen,	$ 6 00
3409.	" " " 4 "	"	65	"	7 50
3410.	" " " 6 "	"	80	"	9 25
3411.	" " " 8 "	"	1 20	"	12 00
3412.	" " " 10 "	"	1 35	"	15 00
3413.	" " " 12 "	"	1 50	"	17 00
3414.	" " " 14 "	"	1 65	"	19 00
3415.	" " " 16 "	"	1 85	"	21 00
3416.	" " " 18 "	"	2 00	"	23 00
3417.	" " " 20 "	"	2 25	"	25 00
3418.	" " " 22 "	"	2 50	"	27 00
3419.	" " " 24 "	"	2 75	"	29 00

MERCURY PLUMB BOBS

No. 3421.	"Mercury" Plumb Bob, 3½ ounces, 4 inches long	Each,	$1 20
3422.	" " " 6 " 4⅝ " "	"	1 80
3423.	" " " 12 " 5⅝ " "	"	2 40
3424.	" " " 16 " 6 " "	"	3 00

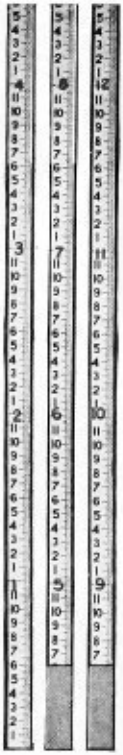
For Plumb Bob Cord and Stake Tacks see page 336

LEVELING RODS

IMPROVED "CHICAGO" LEVELING RODS

No. 3447A.

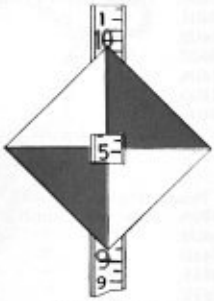
No. 3447B.



No. 3447C.

STADIA TARGETS FOR "CHICAGO" LEVELING RODS

No. 3450B.



No. 3450C.

The improved "Chicago" Leveling Rods are very light and compact. The joints are made of metal and nickel plated, and are locked with an automatic spring catch, thus making the entire rod very rigid.

The rods are made of light, well seasoned hard wood, with fine mahogany finish. The telescoping joints being perfectly flush with the wooden sections, its weight, due to its manner of jointing, is nearly one-half of the old style rods.

For prices see next page

IMPROVED CHICAGO LEVELING RODS —Continued

The figures are made on a stout ribbon made of strong cloth and glued to the face of the rod. It is then varnished over, which will protect it thoroughly against moisture. When worn, or when the figures become indistinct, this ribbon can simply be torn off and replaced with a new one.

The figures are very clear and distinct, and exposed the entire length of the rod. It can, therefore, be used very conveniently as a Stadia Rod.

Its shortness when taken apart makes it very convenient for use in low roofed mines, one piece being 4½ feet high, on level ground two pieces 8½ feet long will be found sufficient. The three pieces put together give it its standard height of 12½ feet. An extra length will increase the height to 16½ feet.

The rods are furnished in strong, heavy, canvas sacks, with three pockets folding upon each other, thus making a very convenient and handy package.

The Improved "Chicago" Leveling Rod is essentially a self-reading rod, but will be furnished with target if desired.

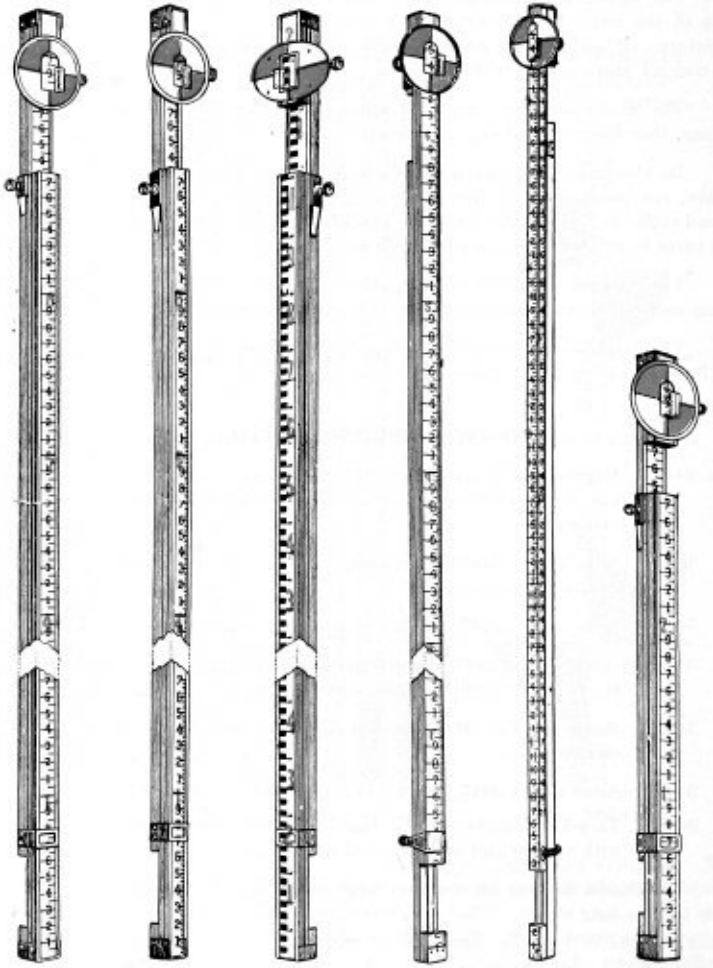
IMPROVED CHICAGO LEVELING RODS

		Each
No. 3447.	Improved "Chicago" Rod, in 3 sections of 4½ feet each, total length 12½ feet, self-reading, plain, with three pocket canvas case for carrying	$ 7 50
3447A.	Same as No. 3447, self-reading, divided in 10ths and 100ths of feet, with canvas case	7 50
3447C.	Same as No. 3447, divided in feet, inches and 8th inch	7 50
3448.	Same as No. 3447, divided in 4 sections, 4½ feet each, total length 16½ feet, self-reading, plain, with four pocket carrying case	10 00
3448A.	Same as No. 3477, divided in 10ths and 100ths of feet, with carrying case	10 00
3448B.	Same as No. 3447, divided in feet, inches and 8th inches	10 00
3449.	Target for Improved "Chicago" Leveling Rod, 5½ inches diameter with vernier and nickel-plated trimmings	1 50

The Stadia Targets are made as large as can be conveniently carried so as to be able to take long sights. They are furnished in pairs, have screw clamps to firmly set them to any fixed point. They can be slid easily up and down the rod and can be readily slipped off.

No. 3450A.	"Chicago" Stadia Targets, large, rectangular	Per pair,	$4 00
3450B.	" " " " round	"	4 00
3450C.	" " " " square	"	4 00

STANDARD LEVELING RODS



3452 3459 3461 3462 3465 3469

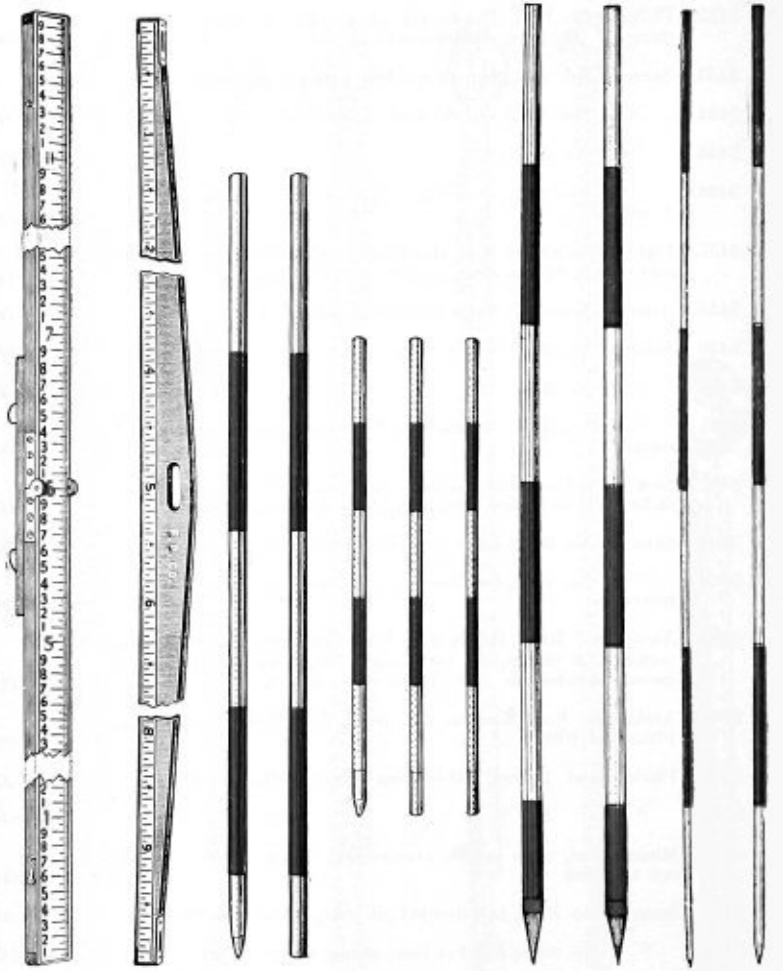
For description and prices, see next page

STANDARD LEVELING RODS —Continued

No. 3452.	Philadelphia Rod, Hardwood, plain, with target, vernier and clamp, 7 feet long, sliding out to 13 feet	Each,	$15 00
3453.	Same as No. 3452, Hardwood, but with rolling angle target	"	16 00
3454.	" No. 3452, but divided in feet, 10ths and 100ths	"	15 00
3455.	" No. 3453, " " " "	"	16 00
3456.	" No. 3452, " metric, 2.2 meters, sliding out to 4 meters	"	15 00
3457.	Light Philadelphia Rod, Hardwood, plain, with target, vernier and clamp, 6¼ feet long, sliding out to 12 feet	"	13 00
3458.	Same as No. 3457, but with rolling angle target	"	14 00
3459.	Same as No. 3457, but divided in feet, 10ths and 100ths	"	13 00
3460.	" No. 3458, " " " "	"	14 00
3461.	" No. 3457, " metric, 2 meters, sliding out to 3.7 meters	"	15 00
3462.	New York Rod, with target, vernier and clamp, 6½ feet long, sliding out to 12 feet, divided in feet, 10ths and 100ths	"	14 00
3463.	Same as No. 3462, but with rolling angle target	"	15 00
3464.	" No. 3462, but metric, 2 meters, sliding out to 3.7 meters	"	14 00
3465.	Architects' Rod, Hardwood, brass mounted, with target vernier and clamp, 5½ feet long, sliding out to 10 feet 6 inches, divided in feet, inches and ⅛-inches	"	6 00
3466.	Architects' Rod, same as No. 3465, but divided into feet, 10ths and 100ths	"	6 00
3467.	Florida-Rod, 10 feet, self reading to feet, 10ths and 100ths.	"	8 00
3468.	" " 12 " " " " " " " "	"	10 00
3469.	Mining Rod, with target, vernier and clamp, 3 feet, sliding out to 5 feet	"	12 00
3470.	Same as No. 3469, but divided into feet, 10ths and 100ths	"	12 00
3471.	" No. 3469, but five feet, sliding out to 9 feet	"	12 75
3472.	" No. 3470, but " " " 9 "	"	12 75

For other rods see page 332

LEVELING RODS AND RANGING POLES



3473. 3474. 3475. 3476. 3477. 3478. 3480. 3481.

For description and prices see next page

STANDARD LEVELING RODS —Continued

No. 3473. **Stadia Rod,** self-reading to 100ths, folding, with strong bronze hinge, folded 6 feet, open 12 feet ..... Each, $12 00

3474. **Cross Section Rod,** 10 feet, divided on both sides into 10ths and 100ths feet, with level bubble on each end and opening for hand ..... " 10 00

RANGING POLES

All the ranging poles listed here are painted red and white alternately.

No. 3475. **"Chicago" Ranging Pole,** Hardwood, Steel Tubing, round, sectional ..... Each, $3 00

The "Chicago" Ranging Pole is in two sections, each 4½ feet long, lengthening out to 8½ feet, 1 1/16 inches diameter, jointed with metal telescope tubing, perfectly fitted, making an absolutely rigid pole. Shod with a brass shoe and steel tip. The joints have a spring catch, which prevents it from being pulled apart. Furnished with strong two-pocket canvas bag.

No. 3476. **"Chicago" Mining Pole,** Metal, round, ⅝-inch diameter, sectional. Each, $3 00

The **"Chicago" Mining Pole** is in three sections, each 33 inches long, lengthening out to 7¾ feet, ⅝-inch in diameter, jointed with telescope tubing, perfectly fitting, making an absolutely rigid pole. Shod with brass shoe and iron tip. The joints have a spring catch, which prevents them from being pulled apart. Furnished in strong three-pocket bag. Is very light and very strong.

No. 3477. Ranging Pole, best seasoned Hardwood, tapered, octagonal.

	6 ft.	8 ft.	10ft.
Each	$2 00	2 25	2 50

3478. Ranging Pole, best seasoned Hardwood, tapered, round.

	6 ft.	8 ft.	10 ft.
Each	$2 00	2 25	2 50

3479. Steel Ranging Pole, ½-inch diameter, octagonal, solid.

	6 ft.	8 ft.
Each	$3 20	3 50

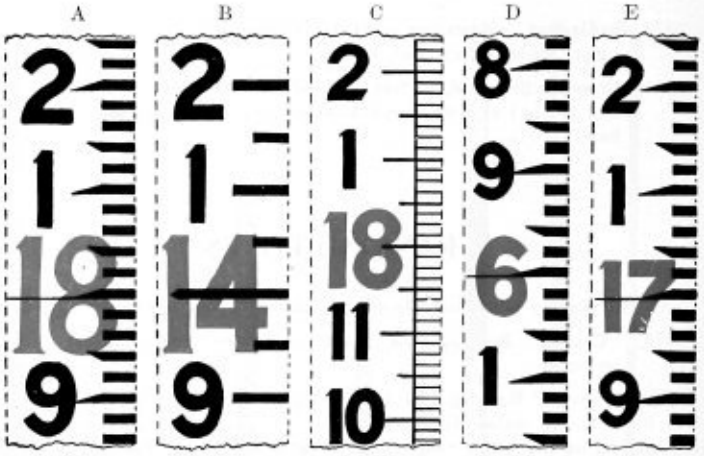
3480. Steel Ranging Pole, ½-inch diameter, round, solid.

	6 ft.	8 ft.
Each	$2 75	3 00

3481. Tubular Iron Ranging Pole, ⅝-inch diameter.

	6 ft.	8 ft.	10 ft.
Each	$2 75	3 00	3 50

"CHICAGO" ROD RIBBON



3482A. 3482B. 3482C. 3482D. 3482E.

No. 3482A.	Divided in 10ths and 100ths, for refacing No. 3447A, 12½ feet	Each,	$1 00
3482B.	Plain, for refacing No. 3447, 12½ feet	"	1 00
3482C.	Divided in feet, inches and eighths, for refacing No. 3447B, 12½ feet	"	1 00
3482D.	Plain, for Philadelphia and other rods, 12½ feet	"	1 00
3482E.	Divided in 10ths and 100ths, for Philadelphia and other rods, 12½ feet	"	1 00

FLEXIBLE POCKET LEVELING RODS

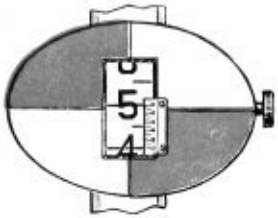
No. 3484.

		Each
No. 3484.	Flexible Pocket Leveling Rod, 10 feet long, divided into feet, 10ths and 100ths	$3 25
3485.	Flexible Pocket Leveling Rod, like No. 3484, but 12 feet long	4 00
3486.	Flexible Pocket Leveling Rod, 12 feet long, divided into inches and ⅛ inches	4 00
3487.	Flexible Pocket Leveling Rod, 3½ meters long, divided into centimeters	4 00

These Rods are made of pliable, strong, rubber canvas, divided like self-reading rods. Can be coiled up and carried in the pocket. For use, they are fastened to a board or stick with thumb tacks.

SEPARATE TARGETS FOR LEVELING RODS

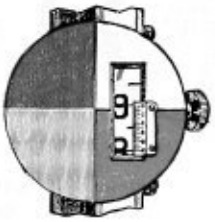
No. 3493.

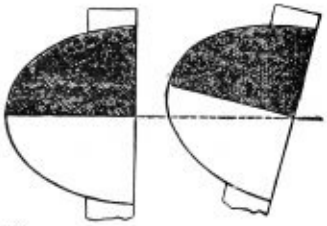


No. 3491.

No. 3491. Target for Heavy Philadelphia Rods.....Each, $5 00
3492. " " Light " " ..... " 5 00
3493. " " New York " ..... " 5 00

When ordering extra targets, please give exact cross section of the rod and its divisions or give its catalogue number.





No. 3494.

No. 3494. Rolling Angle Target for Heavy Philadelphia Rods.....Each, $6 00
3495. " " " " Light " " ..... " 6 00

No. 3496.

The object of this target is to make sure that the rod is being held perpendicular to the line of sight of the observer. The horizontal dividing line of these targets extends over two surfaces, placed at right angles to each other, thus showing a continuous and unbroken line only when the rod is held perfectly vertical.

The target strings have rollers bearing against the rods, which permits the target to be slid easily up and down the rod and therefore allows a very much more accurate sitting.

ROD LEVEL

No. 3496. Rod Level, brass, circular bubble level, 1 inch diameter.....Each, $3 00

This Rod Level is used to determine if the rod is being held perpendicular. Proper contact is insured through the long angle blade when held to the rod. It may also be attached to the rod by means of a screw, for which there is a key-hole slot in the blade.

STAKE TACKS

No. 3530.

No. 3530. Stake Tacks, galvanized.....Per 2 ounce box, $0 15
3531. " " " .....Per pound, 50

PLUMB BOB CORDS

No. 3535. Plumb Bob Cord, best linen; thin, medium or thick.....Per yard, $0 02
3536. " " " best braided silk, " " " ..... " 06

TALLYING MACHINES

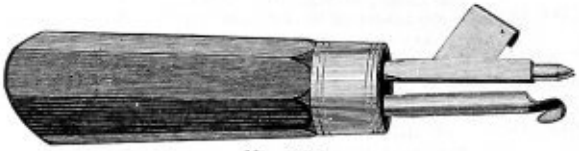
No. 3540.

No. 3542.

No. 3540. "Economy" Automatic Tally Register, vest pocket size, registering from 1 to 10,000.Each, $4 00

3542. Tallying Machine, for keeping count by pressing on a knob, nickel-plated, registering from zero up to 999.....Each, 2 50

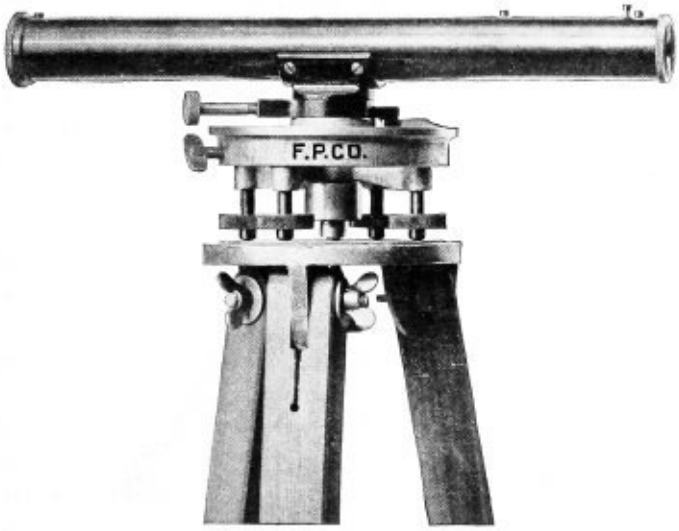
TIMBER SCRIBES



No. 3545.

No. 3545. Timber Scribe or Tree Marker, small.....Each, $1 00
3546. " " " " large..... " 1 25

FARM LEVELS



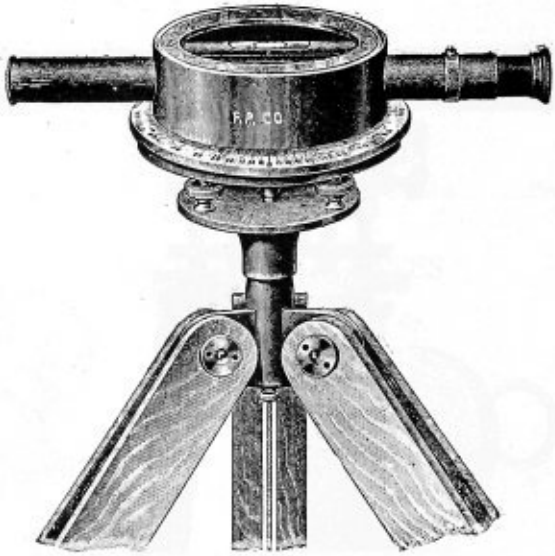
No. 3840.

No. 3840. Farm Level, telescope 10 inches, made of oxidized brass with pinhole eyepiece and plain glass front, spirit level set in telescope and cross hairs, horizontal circle 4 inches in diameter graduated in degrees with clamp and set screw. Instrument complete in wooden box with plumb bob, flexible rod ribbon and tripod. Directions with each level.....Each, $16 00

3841. Farm Level, same as No. 3840, but telescope having lenses and focusing eyepiece showing object erect. Instrument complete in wooden box with plumb bob, flexible rod ribbon and tripod. Directions with each level.....Each, 25 00

The above two instruments operate in a simple form, they are especially designed for draining, ditching, road making, laying out farm lands, and similar work which requires only a certain degree of accuracy. Their construction and the directions going with them are exceedingly simple so as to enable anyone to operate the instrument very readily.

BOSTROM'S IMPROVED BUILDERS' LEVEL



No. 3850.

The advantages of this Level to the builder and contractor are so numerous that they will be apparent at the first thought of its many uses, such as Leveling Foundations or Setting Machinery, Floor Timbers and Sills, Leveling Lines of Shafting, for ascertaining the Height of Springs, Water Falls, etc., for Laying off Drains, Ditches, Irrigation Canals and Laterals, in fact, any and all the uses to which a level can be put. This level is constructed of brass, highly lacquered and finished, has a graduated circle divided into 360 degrees, numbered from zero to 90 degrees in both directions, giving zero points on opposite sides of the circles, and clamping screw for holding in any position. It has a ground level vial, which makes the instrument very sensitive and accurate. The telescope is acromatic, giving a clear field, and the magnifying power of the eye piece is as great as can be used to advantage on an instrument of this kind. The cross-hairs are set in the eye piece and cannot be dislodged or destroyed except through carelessness or smashing of the other parts of the instrument. The rod is of hardwood, five feet when closed and extending to nine and one-half feet, has sliding target and is graduated to feet, inches, and one-fourth of an inch.

No. 3850. Bostrom Level, complete in polished box, with tripod and Level Rod, Each $25 00

ENGINEERING AND SURVEYING INSTRUMENTS

In the pages following we present our description and illustrations of the various styles of Engineering and Surveying Instruments, as manufactured by us according to our **own designs and patterns.** The illustrations shown are true representations of the instruments as made by us. It is our aim to keep pace with the advancement in science and **improve upon them continually.**

With a department devoted entirely to the manufacture and repairing of Engineering, Surveying and Scientific Instruments, a careful selection of skilled workmen, increased facilities and application of the most approved tools and machinery, our instruments are **superior in quality to many others.**

By long experience in the manufacture of Engineering, Surveying and Scientific Instruments we are enabled to unite in our instruments **the highest accuracy and finish, lightness combined with strength,** securing steadiness, practicability and portability desired by American Engineers, etc.

We have the best Instruments that it is possible to manufacture, and we feel confident that upon investigation you will find the practicability of and workmanship on our instruments all we claim for them.

WE POSITIVELY GUARANTEE THE ACCURACY AND WORKMANSHIP OF ALL OUR INSTRUMENTS

The Instruments described and illustrated in this catalogue are our regular patterns, which we have in stock, but we are prepared to carry out, as far as feasible, any suggestions as to details of construction which the practical experience of our professional friends may lead them to desire.

ENGINEERING AND SURVEYING INSTRUMENTS
—Continued

IMPORTANT PARTS DESCRIBED

PARTS OF SURVEYING INSTRUMENTS

Showing method of ribbing, etc., in order to make instruments light and stiff.

GENERAL CONSTRUCTION

In the general construction of our surveying instruments, the dead weight is removed wherever it is shown to be not essential to the stiffness of the instrument; but we have at the same time strengthened the parts most likely to be injured by an accident or fall. Thus the base of the standards, the vernier plates and circles, the parallel plates for leveling screws, the telescope axis, the flanges of centers, cross-bar of level, etc., are made especially rigid and **provided with ribs.** (See illustrations). Instead of finishing the smaller pieces of an instrument separately and then joining them with small screws or solder, each screw or joint being a weak place in an instrument, we have adopted the opposite principle, and aim to unite as many pieces as possible in a single casting, which casting, by means of ribs, is made as light as is consistent with strength.

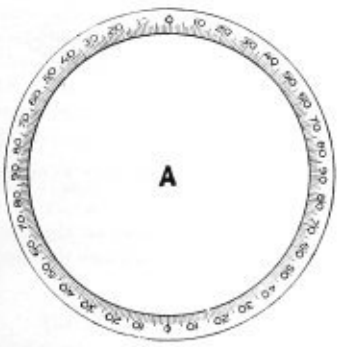
We also call attention to the exceptionally hard bell-metal used for our centers and telescope axis, which are long and unyielding, and the remaining parts are of a composition metal, which is itself harder than hammered brass, used ordinarily for centers, etc. Experience has proven that soft or hammered yellow brass is unfit for a good field instrument, since it is more liable to fretting and yielding generally, and in the hammered state its unequal expansion and contraction at different temperatures may be so marked as to impair the reliability of the adjustments.

ENGINEERING AND SURVEYING INSTRUMENTS
—Continued

IMPORTANT PARTS DESCRIBED

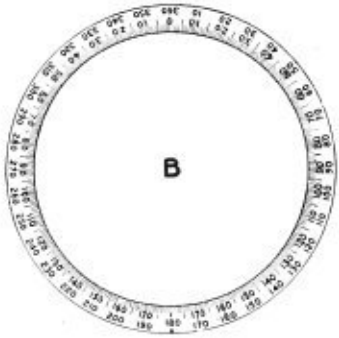
GRADUATIONS

This very important part of an instrument we guarantee exact and correctly centered opposite verniers reading the same. The lines are straight, very black and uniform in width. On all transits from Nos. 3930 to 3973 there are two double verniers. The horizontal circle is graduated from 0 to 360 degrees, with two rows of figures running in opposite directions, and the verniers are marked A and B. The figures are distinct and clear. The verniers are placed at an angle of 30 degrees, and can be read without changing the position of the engineer after sighting through the telescope. Glass covers protect the limb and verniers from exposure, and to make vernier reading easy we have **added ground glass shades,** which cast a clear light on the verniers in any position. The graduations on our instruments are on brass, silvered, or on solid silver; the smoothness of surface makes the latter preferable.



Vertical Circle

A



Horizontal Circle

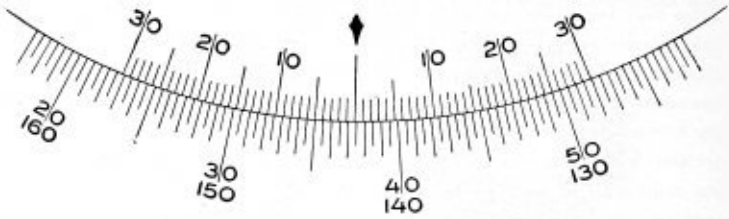
B

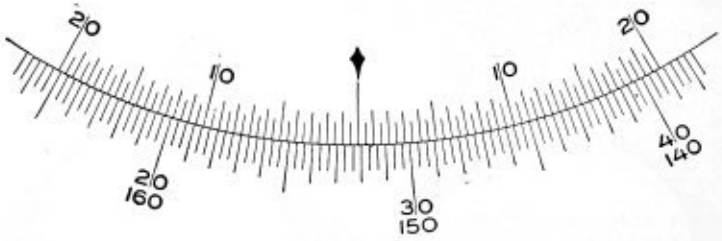
The above illustrations show the most usual methods of graduating circle and verniers. A represents a circle with double vernier reading to one minute, B represents circle with double vernier reading to 30 seconds.

ENGINEERING AND SURVEYING INSTRUMENTS
—Continued

IMPORTANT PARTS DESCRIBED

GRADUATIONS—Continued





Other graduations of any desired fineness we are prepared to furnish to order in accordance with the special wishes of our customers.

The two rows of figures on the horizontal circle and the figures on the double vernier incline in opposite directions corresponding to the direction in which the vernier is read.

COMPASS CIRCLE

The Compass Circle is provided either with a fixed graduated ring or with a variation plate. The needle is made of the very best steel of the so-called edge-bar construction, being wider at the ends than in the middle in order to facilitate reading; has a jeweled center and is exceedingly sensitive. It is balanced at its south end by means of a coil of fine wire in order to compensate the magnetic dip. This wire can be shifted to correct for changes in the inclination, which vary in different localities. The compass is graduated to half degrees and numbered in quadrants.

ENGINEERING AND SURVEYING INSTRUMENTS
—Continued

IMPORTANT PARTS DESCRIBED

STADIA WIRES

Of late years, the introduction of Stadia or Telemeter measurements has, with the aid of more powerful telescopes, met with fair success. Under certain conditions the Stadia will certainly supersede ordinary chaining, especially over rough ground, rivers, streams, etc., and where the distance of vision is not too great, good results may be expected. Adjustable wires being uncertain and subject to disturbance by changes of temperature, **we recommend fixed wires,** so placed that they will cover an exact space of one foot at 100 feet distance.

The proper starting point for Stadia measurement is a point at a distance in front of the object glass equal to its focal strength; this point will be found by measuring the distance from the face of the object glass to the center of the cross-wire screws.

The correct measurement thus found is a **constant,** and must always be **added to the distance of observation.** Or we can so arrange Stadia wires as to have starting point from center of instrument. Customer should clearly specify if he wishes to measure distance from center of instrument or to use a constant.

GRADIENTER SCREW

In place of the ordinary tangent screw usually applied to the vertical clamp movement, we can substitute a screw cut with the greatest precision, so that **two revolutions** shall **equal one foot in 100 feet** distance. The head of this screw is considerably larger than the ordinary tangent screw, and is divided into fifty parts. Thus it follows that one revolution is equal to 50-100 of a foot in 100 feet distance. A small scale attached to the clamp, and divided to correspond to the pitch of the screw, records the number of revolutions made.

With proper care, grades can be established very rapidly, and horizontal distances, vertical angles and difference of level measured accurately.

We consider this attachment as one of great importance and almost indispensable in practical engineering, and we have no doubt that it will be appreciated by engineers when accustomed to its use.

THE TELESCOPE

The Telescope is one of the most important parts on engineering and surveying instruments. All lenses are ground by the best opticians and thoroughly tested before being applied to the telescope. The objective glass, perfectly achromatic, is made of the celebrated **"Jena"** glass, which has a greater index of refraction and power of dispersion, consisting of **two lenses** which are **cemented together** so as to form one lense only. This method prevents the settling of a film between the lenses. We generally provide the telescopes with erecting eye-pieces unless ordered to the contrary. The object glass is focused by rack and pinion, but the eye-piece is focused by a screw-like motion arrangement. Particular attention is paid to the fitting of the object slide, which fits directly in the main body tube and requires no further adjustment.

ENGINEERING AND SURVEYING INSTRUMENTS
—Continued

IMPORTANT PARTS DESCRIBED

SPIRIT LEVELS

This important part of an instrument is sometimes treated as of secondary importance, though it is absolutely necessary to pay as much attention to a spirit level as to a telescope or a graduated circle. It is the pioneer that guides the engineer in all his horizontal and vertical measurements, and if the level is not sensitive and quick to respond and is not ground to an **even curvature**, so that the bubble will travel evenly and the same distance for every minute of arc to the extreme ends of the tube, an otherwise perfect instrument will not work well; whereas with good levels, instrumental errors may be corrected.

The level vials as applied to our instruments are all ground on our new machine, which not only shapes them to a perfect curve of any desired radius, but it also grinds the entire interior surface, making them completely symmetrical.

As to their sensibility, they are carefully selected in accordance with the use of the instrument for which they are intended.

LEVELING SCREWS

The Leveling Screws are used more than any other part of instruments and it is evident that they have to be very durable. Our leveling screws have therefore a very deep and accurately cut thread, are provided with milled finger heads and protected by dust caps.

CLAMPS AND TANGENT SCREW

The Clamps are all cast in **one piece** and have two long arms to one of which the screw has been fitted, while to the other arm the tangent screw has been attached, to permit a very delicate motion of the plates. Most of the screws are placed so that while they are easily accessible they are still well protected and out of the way. The screws are made of hard metal and are provided with a counter spring to take up the lost motion.

REPAIRS OF SURVEYING INSTRUMENTS

As our location requires us to repair all the various makes of instruments in the country, while Eastern establishments, as a rule, only repair their own, we were obliged to procure all the material, patterns, tools, etc., necessary for these. Having the patterns for all those parts which often want to be replaced when injured by falls, such as the axis to the Telescope, Centers, etc., Object Glasses and Eye-Piece Lenses of any desired focus; Level Vials of every diameter and length; we are prepared to do the work as economically and promptly as the maker himself can do it. By sending their Instruments to us, the Western and outhern Engineers and Surveyors will save several days' time and from two to three dollars expressage.

Repairs to Instruments injured by accident are generally more serious than the Engineer supposes, and usually the cost of these repairs exceeds the anticipated amount. There are several reasons for this. Breakage of parts is evident to the Engineer, and he generally attributes the whole cost of repairs to this alone, whereas these evident breaks form the lesser portion of cost, the greater cost being in points only developed by more critical examination, and of which he has no idea. None but those familiar with repairing can realize the time consumed in removing what appears a trival fault, but which the correct working of Instrument requires to be thoroughly eradicated. When we consider the severe tests to which the various fittings of the Instrument are subjected, by means of the graduations, of the Level and of the Telescope, the necessity for repair, as near perfection as possible, regardless of time consumed, becomes evident, and the cost of these repairs explained. What may be termed, in contradistinction to the Engineer's adjustment, the Instrument Maker's adjustment, which consists in placing all parts of the Instrument correctly together, so as to work smoothly, detecting any points which may be wrong, seeing that no part is strained, that the Needle, Verniers and Plates are properly centered, etc., cannot be conscientiously and well performed in the Transit under a cost of $5.00; and in a Level under $3.00. These are independent of cost of repairs, which are charged according to time consumed.

In course of repairs, points of injury not apparent to the Engineer develop themselves, and those which appeared trifling, because of their minor importance, become serious when the more prominent are corrected; so that it happens that Instruments are frequently sent to be repaired at certain points, and yet when those points are repaired, the Instrument is almost, if not quite, as useless as before. We have adopted, as our rule, to thoroughly examine and repair every Instrument sent, believing it most satisfactory and economical to the Engineer, and feeling assured the result is in all cases beneficial and in the end satisfactory.

We can furnish estimates of cost of repairs, if Instruments are sent us.

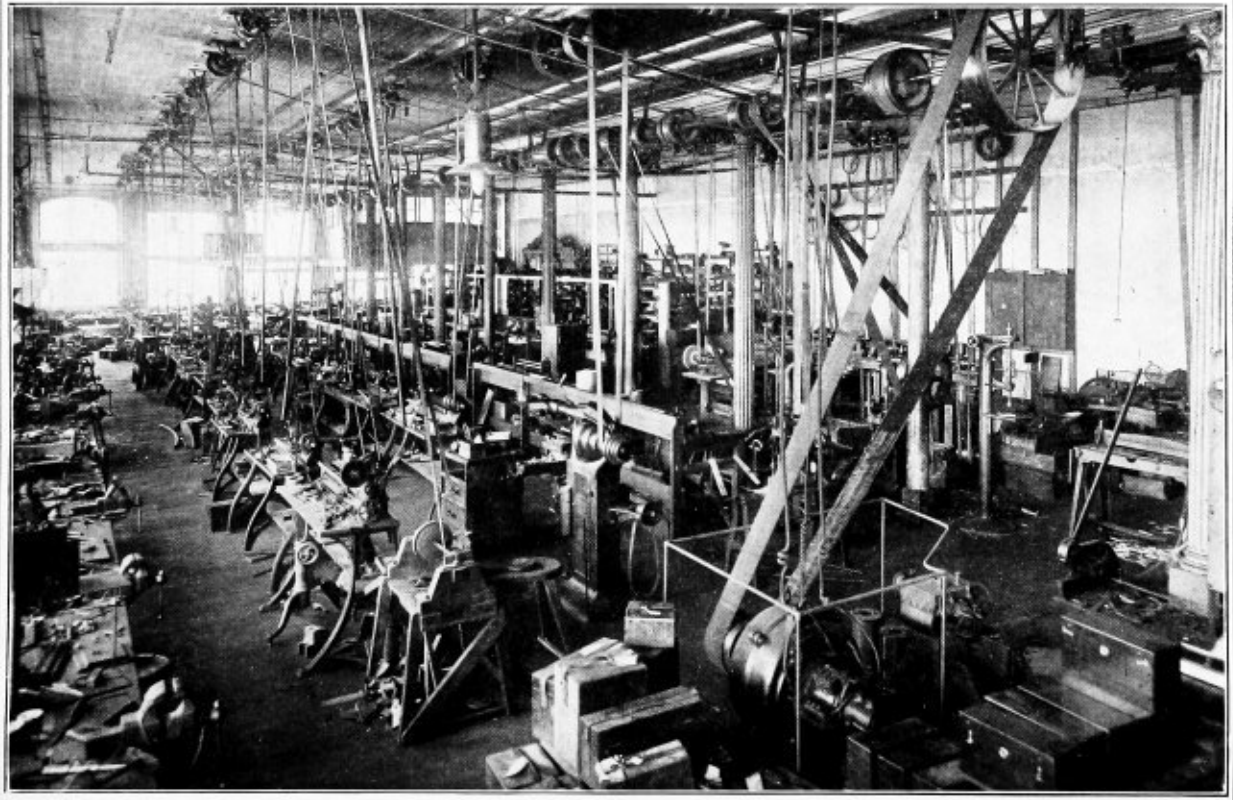
Instruments sent for repairs should be carefully packed. They are at times much injured in coming to us for want of this care.

Place in box address of party sending and memoranda of points which Engineer considers require attention, though not necessary, may be of advantage. It is advisable to place our name in full.

Tripods need not be sent, unless of a special pattern.

Always send the "Ball-Spindle" with Compasses.

Instruments sent for repairs must be shipped prepaid.



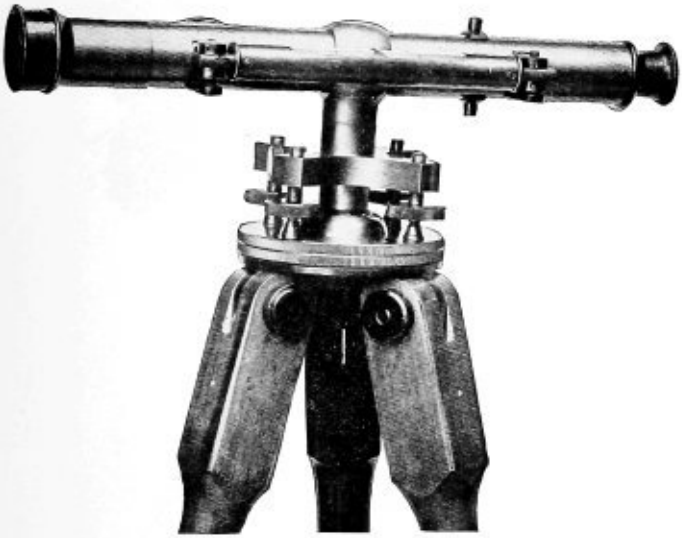
THE FREDERICK POST CO.

SURVEYING INSTRUMENT DEPARTMENT, FACTORY

SURVEYING INSTRUMENTS

ARCHITECTS' DUMPY LEVELS

Each Instrument is warranted to be first-class in every particular



No. 3892.

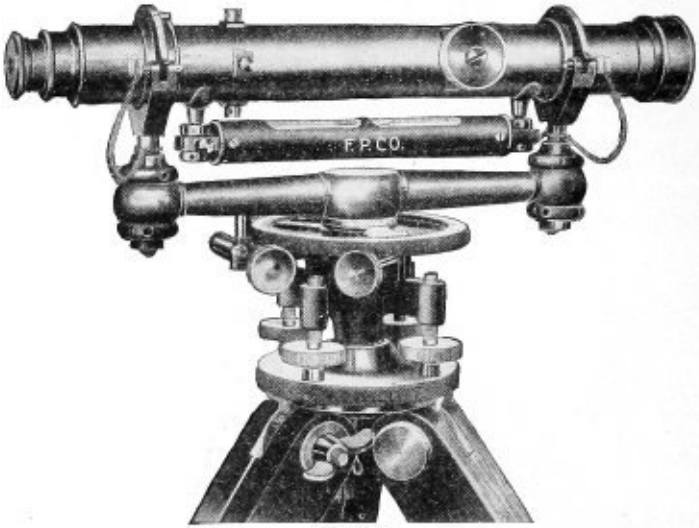
No. 3890. Architects' Dumpy Level. Telescope about 12 inches long, magnifying power 25 diameters, Objective 1¼-inch aperture, with adjustable eyepiece for focusing cross hairs, rack and pinion movement for focusing objective, dust cap, sun shade, graduated bubble to telescope. Complete in neatly polished box, with plumb bob, adjusting pins, hardwood tripod and metal trivet.....Each, $35 00

3892. Architects' Dumpy Level. Same as No. 3890, but with a 3½-inch horizontal circle, divided to degrees, reading by a vernier (which is attached to the spindle) to 5 minutes. Horizontal circle is reversible for the purpose of setting the instrument at zero at any given point. Each.....$40 00

SURVEYING INSTRUMENTS —Continued

ARCHITECTS' AND BUILDERS' LEVEL

Each instrument is warranted to be first-class in every particular



No. 3900.

No. 3900. **Architects' and Builders' Level,** with telescope 11½ inches long, magnifying power 18 diameters, with four leveling screws and clamp to spindle. Horizontal circle three inches in diameter, fitted to the upper end of the socket and turning readily. The circle is graduated to drgeees, numbered from 0 to 90 each way, with vernier reading to five minutes, screwed to flange of center, telescope is focused by rack and pinion. The eye piece turns in a screw-like manner to enable precise focusing of the cross hairs. The bubble is 5 inches long and graduated on the glass. Instrument complete in mahogany box, with leather strap, with plumb bob trivet, adjusting pins, sun shade and plumb bob, with tripod No. 4011.....Each, $45 00

3902. Like No. 3900, **but with tangent screw**..... " 50 00

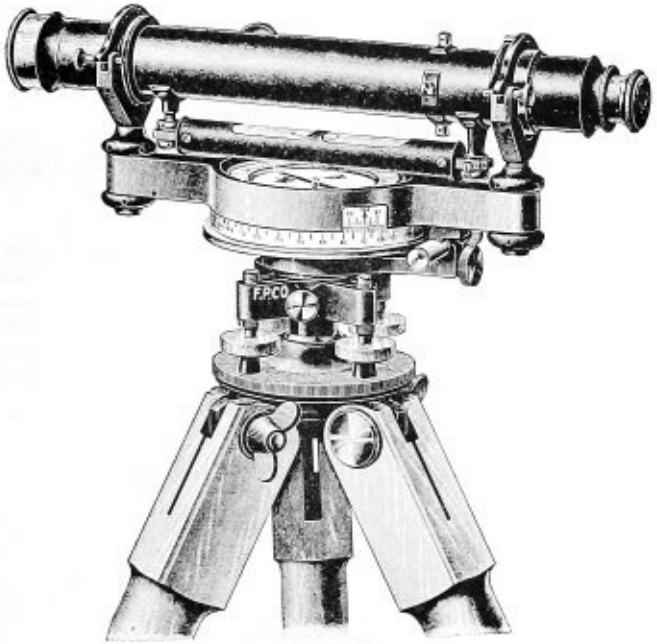
If 15-inch telescope is desired in place of 11½-inch on above two instruments, add $20.00 to the price.

These two instruments are furnished with Tripod No. 4011

SURVEYING INSTRUMENTS —Continued

ARCHITECTS' LEVEL WITH COMPASS

Each instrument is warranted to be first-class in every particular



No. 3908.

No. 3906. Architects' Level with Compass, fitted with compass 3 inches in diameter. The advantage of the compass is quite apparent in many kinds of work and the compass is fitted in such a manner that it does not add anything to the weight or bulk of the instrument.

With telescope 11½ inches long, magnifying power 18 diameters, with four leveling screws and clamp to spindle. Horizontal vernier 3⅜ inches in diameter, graduated to degrees with vernier reading to five minutes. Object glass with rack movement and adjustable eye-piece for focusing the cross hairs.

No. 3906. Instrument, complete in mahogany box with leather strap, with plumb bob trivet, adjusting pins, sun shade and plumb bob and with tripod No. 4011 ..... Each, $60 00

3908. Like No. 3906, but with tangent screw ..... " 65 00

If 15-inch telescope is desired in place of 11½-inch, add $20.00 to the above prices.

SURVEYING INSTRUMENTS —Continued

ARCHITECTS' INTERCHANGEABLE LEVEL

No. 3909.

Each instrument is warranted to be first-class in every particular

No. 3909. **Architects' Interchangeable Level,** like No. 3900, but with fixed arms or axes attached to both sides of the telescope fitting in small Wyes provided for them on the frame of the level, which admits of vertical sighting with the telescope, with clamp and tangent screw.

No. 3909. Instrument complete in mahogany box, with plumb bob, etc., and Tripod No. 4011 ..... Each, $60 00
3909A. Like No. 3909, but with tangent screw ..... " 65 00
3909B. " 3909, " compass ..... " 70 00
3909C. " 3909, " compass and tangent screw ..... " 75 00

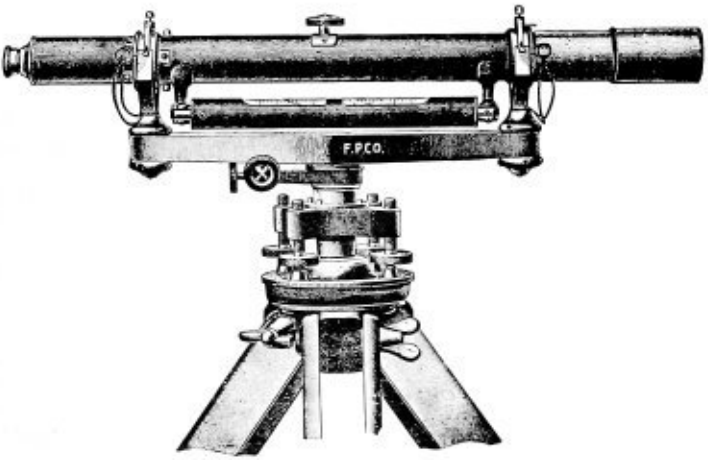
The above is the best Architects' Interchangeable Level made, as it dispenses entirely with the objectionable features of replacing and removing the extra axis or tangent (as made by other makers) each time a vertical line is sighted. For vertical sighting simply lift the telescope out of the Wyes and place it in the small Wyes and it will be ready for use.

For 15-inch telescope in place of 11½-inch on above instruments, add $20.00.

SURVEYING INSTRUMENTS —Continued

ENGINEERS' WYE LEVELS

Each instrument is warranted to be first-class in every particular



No. 3910.

No. 3910. **Engineers' Wye Level,** 18-inch, with Split Leg Tripod No. 4012, Sun Shade, Screw Driver and Adjusting Pins, with Plumb Bob, in mahogany box ..... Each, $110 00

3911. Same as No. 3910, but with 20 inch telescope ..... " 115 00

3912. " " 3910, " 22 " " ..... " 120 00

For description of the above instrument, see page No. 352

For extras for the above instrument, see page No. 370

SURVEYING INSTRUMENTS —Continued

ENGINEERS' 18-INCH WYE LEVEL—No. 3910

This instrument is furnished with a **powerful aperture** of object-glass 1¾ inches in diameter, giving a power of 36 diameters. The eye-piece is provided with an **improved screw arrangement** for the accurate focusing of the cross-hairs. The telescope is provided with an adjustable stop to readily set cross-wires horizontal and perpendicular, line of collimation true on all distances. The telescope is balanced each way from the center when focused to a mean distance with sunshade attached to it to secure the **highest accuracy** attainable. The telescope rings and the center are very stout, long and of the hardest bell-metal. The wyes are our improved model, which will be found the strongest and most convenient made, there being no pins to get lost and the clips cannot possibly get loose. The cross-bar is cast hollow and ribbed. The level is 8 inches long and very sensitive. The instrument complete in **not separable** when put into its box. We believe this to be necessary to protect one of the essential adjustments of the level, and the adjustment of the wyes, from needless derangement.

LIGHT ENGINEERS' 15-INCH WYE LEVEL—No. 3914

The essential features of this instrument are like No. 3910 with the exception of size and weight. It is designed to be used in cases where a lighter instrument is desirable. It is provided with a 15-inch telescope which has an aperture of 1¼ inches in diameter and a power of 27 diameters; 6-inch sensitive spirit level; steel center; four leveling screws.

Weight of instrument with tripod, 15½ to 16½ pounds.

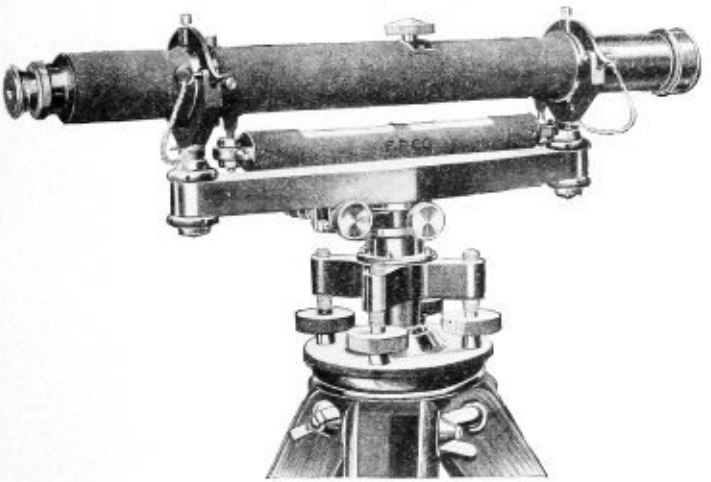
LIGHT ENGINEERS' 18-INCH WYE LEVEL—No. 3914A

This instrument is furnished with a **powerful telescope**; aperture of object-glass 1¾ inches in diameter; eye-piece provided with an improved arrangement for the accurate focusing of cross-wires; field of view large and flat; telescope provided with an adjustable stop to readily set cross-wires horizontal and perpendicular; line of collimation true on all distances; objects erect; telescope balanced each way from the center when focused to a mean distance with sunshade attached to it to secure the **highest accuracy attainable** telescope rings and the center are very stout, long and of the very hardest bell-metal; cross bar is cast hollow and provided with ribs; 8-inch very sensitive spirit level; instrument does not detach from tripod above leveling screws; it packs whole and stands in the case erect. Mahogany case, provided with straps and hooks, contains sunshade, wrench, screw-driver and two adjusting pins.

SURVEYING INSTRUMENTS —Continued

LIGHT ENGINEERS' 15-INCH WYE LEVEL

Each instrument is warranted to be first-class in every particular



No. 3914A.

No. 3914. **Light Engineers' Wye Level,** 15-inch, complete, including a protection to the object-slide.....Each, $130 00

3914A. **Engineers' Wye Level, 18 inch,** complete, including a protection to the object-slide.....Each, 140 00

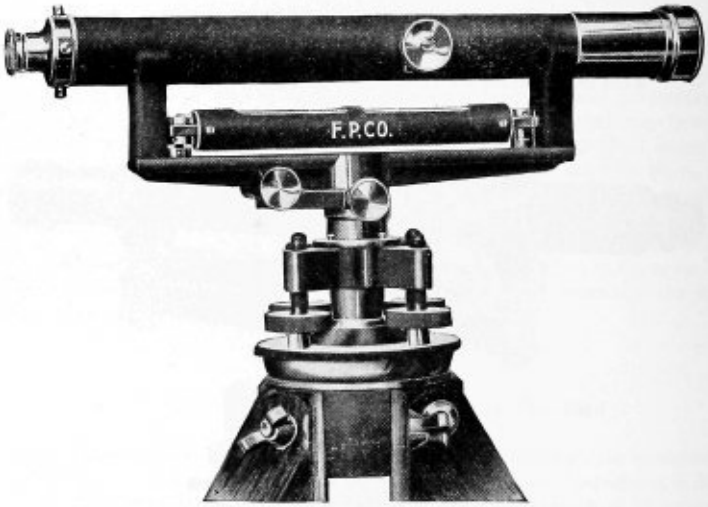
For description of the above instruments, see page No. 352

For extras of the above instruments, see page No. 370

SURVEYING INSTRUMENTS —Continued

NEW MODEL ENGINEERS' DUMPY LEVEL

Each instrument is warranted to be first-class in every particular



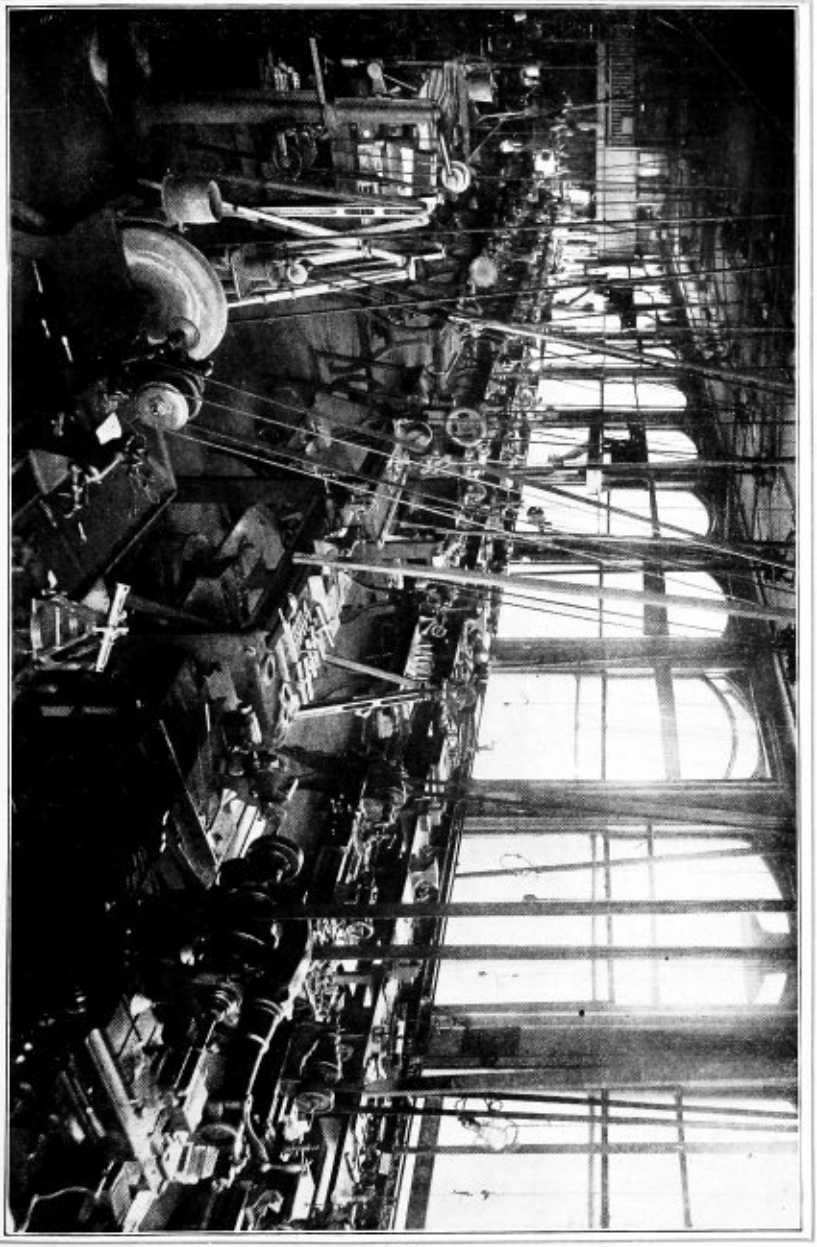
No. 3920.

No. 3920. **New Model Engineers' Dumpy Level,** with erecting achromatic telescope 15 inches long, objective glass, magnifying power 29 diameters, very compact and provided with clamp and tangent movement, in mahogany box, with split leg tripod No. 4012, sun-shade, screw driver, adjusting pins, cloth finish.....Each, $100 00

3921. **New Model Engineers' Dumpy Level,** like No. 3920, but with 18-inch telescope, magnifying power 36 diameters, cloth finish..Each, 110 00

EXTRAS TO DUMPY LEVELS Nos. 3920 and 3921

Center, made of hardened steel	Each,	$10 00
Fixed stadia wires	"	3 00
Gossamer water-proof cover	"	1 00
Mirror to facilitate the reading of the bubble, without changing the position of the observer	"	10 00

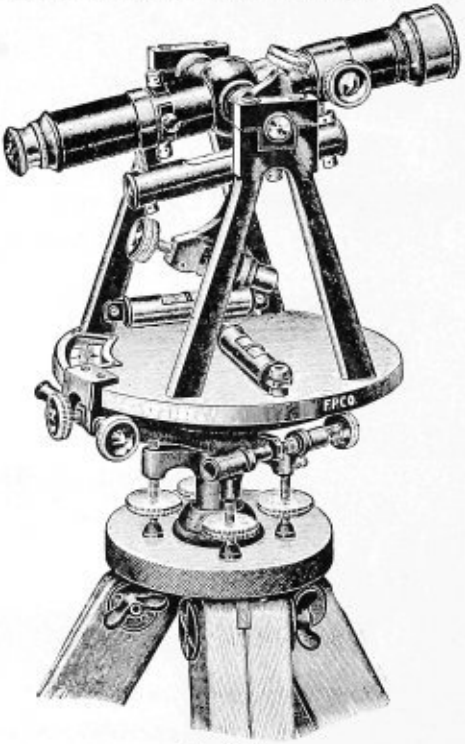


SURVEYING INSTRUMENT DEPARTMENT, FACTORY

SURVEYING INSTRUMENTS —Continued

NEW ARCHITECTS' AND BUILDERS' TRANSIT

Each instrument is warranted to be first-class in every particular



No. 3926.

No. 3926. **Architects' and Builders' Transit,** with 9-inch reversible telescope for repeating angles, with long, graduated spirit level, clamp and tangent screw to axis, graduated limb reading by double vernier to one degree, clamp and tangent movement to both limb and leveling head, the limb numbered from zero to 180 degrees each way; objective moved by rack and pinion and eye-piece focused by spiral movement. In wooden box, with sunshade, plumb bob, screw-driver and adjusting pins, with tripod No. 4011.....Each, $ 80 00

3927. **Architects' and Builders' Transit,** like No. 3926, but with compass. Each..... 100 00

3928. **Architects' and Builders' Transit,** like No. 3926, but with vertical circle with vernier reading to two minutes .....Each, 90 00

SURVEYING INSTRUMENTS —Continued

ENGINEERS' TRANSIT—Plain

No. 3930.

Each instrument is warranted to be first-class in every particular

No. 3930. **Engineer's Transit** with telescope 11½ inches long, reversible, with dust proof guard over object slide, magnifying power 26 to 28 diameters, with improved clamp and tangent screw; diameter of horizontal limb 7 inches, with two double verniers reading to 30 seconds or single minutes (vernier placed at an angle of 30 degrees to line of sight), graduated in two rows of numbers, reading in opposite directions from zero to 360 degrees. Vernier and graduations are protected with fine plate glass and ground glass shades over vertical openings to facilitate reading of graduations. Magnetic needle 4½ inches long, shifting center. Complete in mahogany box with plumb bob, sun shade, screw driver, magnifying glass and adjusting pins, with split leg tripod No. 4012 ..... Each, $160 00

3931. **Engineers' Transit,** like No. 3930, but graduated on solid silver. Each 170 00

For extras for Engineers' Transits, see page 370

SURVEYING INSTRUMENTS —Continued

ENGINEERS' TRANSIT—With Level Attachment

Each instrument is warranted to be first-class in every particular

No. 3940.

No. 3940. **Engineers' Transit,** same as described under No. 3930, but with level attachment consisting of very fine spirit level, mounted on glass, attached to telescope. Horizontal limb 7 inches in diameter, magnetic needle 4½ inches long, in mahogany box with plumb bob, sunshade, magnifying glass, screw-driver and adjusting pins, with split leg tripod No. 4012.....Each, $175 00

3941. **Engineers' Transit,** like No. 3940, but graduated on solid silver. Each..... 190 00

SURVEYING INSTRUMENTS —Continued

ENGINEERS' TRANSIT—With Vertical Circle

Each instrument is warranted to be first-class in every particular

No. 3958.

No. 3958. **Engineers' Transit,** like No. 3940, but with vertical circle 5 inches in diameter, graduated on silvered brass to half degrees, with vernier reading to 30 seconds, magnetic needle 4½ inches, horizontal limb 6 inches, and fixed stadia wires. Instrument complete in mahogany box with plumb bob, sunshade, magnifying glass, screw-driver, adjusting pins and with split leg tripod No. 4012.....Each, $190 00

3959. **Engineers' Transit,** like No. 3958, but with vertical limb graduated on solid silver. Instrument complete.....Each, 200 00

For extras for Engineers' Transits, see page 370

SURVEYING INSTRUMENTS —Continued

ENGINEERS' TRANSIT—With Vertical Arc

Each instrument is warranted to be first-class in every particular

No. 3960.

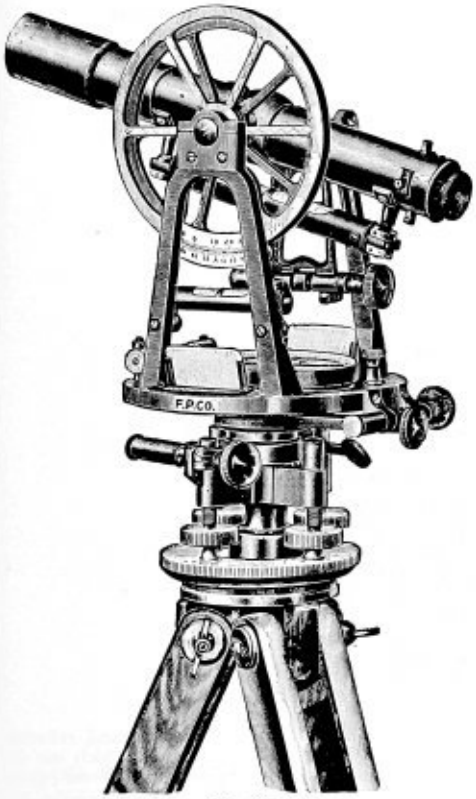
No. 3960. **Engineers' Transit,** is designed for engineering work of a high class, such as is required in bridge building, waterworks, and for city and land surveying. The size of the circle is such that it may be graduated to read to 30 seconds or 20 seconds without fatigue to the eye. The telescope is of the best definition, and has a large aperture with perfectly flat field. The eye-piece is achromatic, and gives a large field with plenty of light. We advise our customers to order solid silver graduations for this instrument, also ground glass shades over the verniers. Complete in box with split leg tripod No. 4012, stadia hairs, plumb-bob, sunshade, magnifying glass, screw-driver and adjusting pins.....Each, $210 00

For extras for Engineers' Transits, see page 370

SURVEYING INSTRUMENTS —Continued

LIGHT MOUNTAIN AND MINING TRANSIT

Each instrument is warranted to be first-class in every particular



No. 3973.

No. 3973. **Light Mountain and Mining Transit.** The centers and the telescope axis are made extra strong, so as to permit of attaching a side, or top telescope if desired, and to bring the instrument more within the range of the larger mining transit.

The 4½-inch horizontal limb is graduated to ½ degrees, on solid silver, and is read by two double opposite verniers to single minutes; the circle has two rows of figures, the inside row is numbered into quadrants and the outside row from 0 to 360.

The vernier openings are at an angle of 30 degrees to line of sight. The compass needle is 2¾ inches long and the vertical circle 4½ inches diameter, and is protected with an aluminum guard. The telescope is 7½ inches long, has a magnifying power of 16 diameters, is provided with dust guard over object slide and a 4 inch sensitive level. The instrument is furnished with improved clamp and tangent screws; has shifting center and is securely packed in a highly finished case which is provided with hooks, leather strap, etc., and contains sunshade, plumb bob, and several adjusting pins.

Weight of instrument, complete with tripod, 10½ pounds.

No. 3973. **Light Mountain and Mining Transit,** with vertical circle, aluminum guard, level to telescope, vernier shades, fixed stadia hairs, graduation on solid silver, variation ring to needle, complete, with light extension tripod, box, etc ..... Each, $210 00

For extras for above Transit, see page 370

SURVEYING INSTRUMENTS —Continued

COMPLETE MINING TRANSIT

With Detachable Side Telescope and Reflector for Illuminating Cross Wires

Each instrument is warranted to be first-class in every particular

No. 3975.

No. 3975. **Complete Mining Transit** with detachable side telescope and reflector for illuminating cross wires. Like No. 3973, but with side telescope which can be easily attached or detached. Weight of side telescope and its counterpoise, one pound each.

When the side telescope and its counterpoise are attached to the transverse axis they balance each other and therefore the adjustment of line of collimation of the main telescope is not disturbed in the vertical plane. The horizontal verniers are placed at right angles to line of sight of telescope, in order to make the front plate level of standard size. Instrument furnished with verniers at 30 degrees to line of sight, if so ordered.

No. 3975. Instrument complete in mahogany box with sunshade, plumb bob, screw-driver, magnifying glass and adjusting pins and extension tripod No. 4014 ..... Each, $245 00

For extras for above Transit, see page 370

SURVEYING INSTRUMENTS —Continued

NEW MODEL RECONNOISSANCE TRANSIT

Each instrument is warranted to be first-class in every particular

No. 3980.

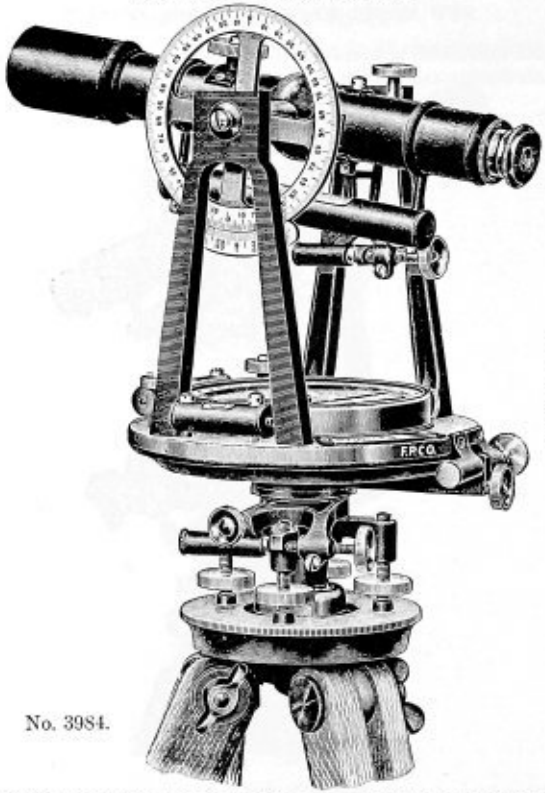
No. 3980, **New Model Reconnoissance Transit** with telescope 9 inches long, magnifying power 18 diameters, with long, sensitive spirit level, vertical circle reading to two minutes, compass needle 3½ inches long, horizontal limb 5 inches in diameter, reading by one double vernier to single minutes. Vernier placed at angle of 30 degrees to line of sight. With improved clamp and tangent screw to limb and axis.

No. 3980. Instrument complete in mahogany box, with plumb bob, sunshade, screw driver, magnifying glass and adjusting pins, with extension tripod No. 4014 ..... Each, $115 00

3981. **New Model Reconnoissance Transit**, same as No. 3980, but with fixed stadia wires ..... Each, 120 00

SURVEYING INSTRUMENTS —Continued

NEW SURVEYORS' TRANSIT



No. 3984.

Each instrument is warranted to be first-class in every particular

No. 3982, **Surveyors' Transit** with telescope 11½ inches long, magnifying power 20 diameters, horizontal limb 7 inches in diameter, with double vernier reading to single minutes. Vernier placed at angle of 30 degrees to line of vision. Compass circle graduated to half degrees and provided with vernier for setting off variation of the needle by rack and pinion.

No. 3982. Instrument complete, in mahogany box with strap, containing plumb bob, sunshade, screw-driver, magnifying glass and adjusting pins with split leg tripod No. 4012.....Each, **$130 00**

3983. **Surveyors' Transit,** like No. 3982, but with sensitive spirit level attached to telescope and clamp and tangent screw to telescope. Each..... 145 00

3984. **Surveyors' Transit,** like No. 3982, but with sensitive level attached to telescope, clamp and tangent screw and full vertical circle, with vernier reading to one minute.....Each, 165 00

SURVEYING INSTRUMENTS —Continued

TRANSIT THEODOLITE

No. 3986.

Each instrument is warranted to be first-class in every particular

No. 3986. **Transit Theodolite.** The telescope standard is of a new design, it is circular in form and is made of one solid casting, which still preserves the 4½-inch compass needle to the instrument.

The horizontal circle is 6¼ inches diameter, is graduated on silver, and is read by two double exactly opposite verniers to 30 seconds. The telescope is 11¼ inches long, object glass 1¼ inch aperture, magnifying power 26 diameters, showing objects erect, the object slide is provided with dust guard. Extra sensitive level to telescope, improved clamp and tangent screws, and covered graduation. The vernier opening can be placed parallel to line of sight, or at right angles as shown in cut. The 5-inch vertical arc is provided with movable vernier and tangent screw.

No. 3986. Transit Theodolite, has 5-inch vertical arc, reversible clamps, level to telescope, vernier shades, fixed stadia hairs, and all graduations on solid silver; complete, with tripod, box, etc.....Each, $250 00

For Extras for Transit Theodolite, see page 366

SURVEYING INSTRUMENTS —Continued

BERGER'S IMPROVED TRANSIT THEODOLITE

No. 3987. Berger's Improved Transit Theodolite. This instrument has been constructed especially for use in large municipalities, where a very precise instrument is required on account of heavy street traffic so as to permit very rapid work with the highest degree of accuracy.

The instrument is so constructed that it has a great deal of lateral strength, which permits of mounting the telescope axis by means of cylinders at each end of the wyes. The cap at each bearing over the telescope axis is provided with an adjusting screw, by means of which the necessary friction for the revolving telescope is obtained. These caps are also provided with two milled headed screws, which can be removed readily, should the telescope have to be reversed for straight line measures over the bearings. The telescope can be reversed the same as in ordinary instruments, through the standards as well as over the bearings. The instrument is furnished with either three or four leveling screws, verniers are placed at angles of 30 degrees to line of sight. With horizontal plate 6¼ inches in diameter, graduated on solid silver, reading to 30 seconds, with two double verniers graduated in two rows of numbers in opposite directions from zero to 360 degrees, with extra long center, 11-inch erecting telescope, object glass 1¼ inches diameter, magnifying power 24 diameters, with four leveling screws, shifting center, with vertical circle 5 inches in diameter, vernier reading to one minute and fixed stadia wires.

For price, see next page.

EXTRAS TO TRANSIT THEODOLITES

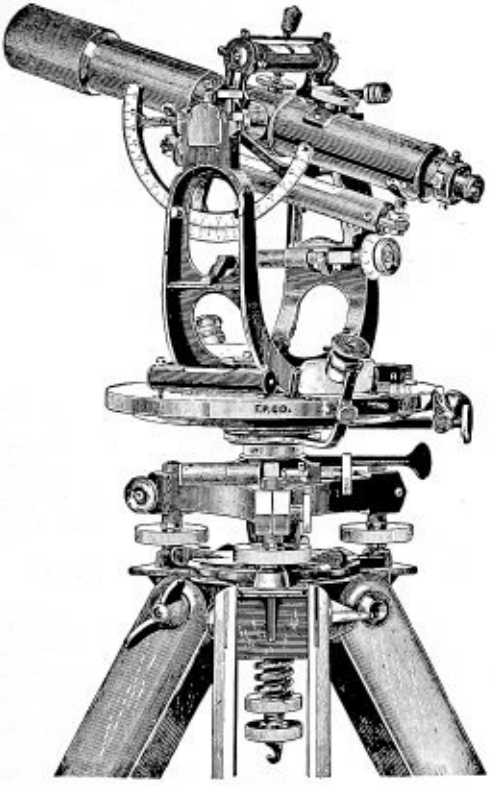
Nos. 3986 and 3987

Full 5-inch Vertical Circle, graduated on silver, reading to minutes	Each,	$25 00
Full 5-inch Vertical Circle, double Verniers, reading to minutes	"	50 00
Graduation on Horizontal Limb, reading to 20 seconds	"	10 00
Graduation on 7-inch Horizontal Limb, to 10 seconds	"	35 00
Reversion Level	"	10 00
Attached Reading Glasses to Verniers	"	10 00
Striding Level	"	15 00
Gradienter Screw		5 00
Gossamer Cover for Instrument	"	1 00

SURVEYING INSTRUMENTS —Continued

IMPROVED TRANSIT-THEODOLITE

Each instrument is warranted to be first-class in every particular



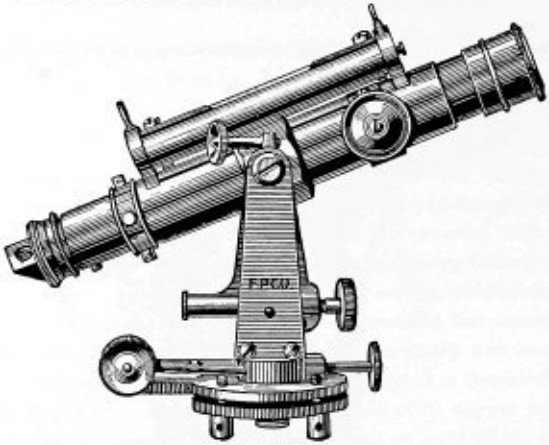
No. 3987.

No. 3987. **Improved Transit Theodolite,** in mahogany box with plumb bob, sunshade, magnifying glass, screw-driver, adjusting pins and with split leg tripod No. 4012.....Each, $250 00

For Extras for Improved Theodolite, see page 366

SURVEYING INSTRUMENTS —Continued

THE SAEGMULLER IMPROVED SOLAR ATTACHMENT



No. 3990.

The Solar Attachment consists essentially of a small telescope and level, the level being mounted in standards, in which it can be elevated or depressed. The standard revolves around an axis, called the polar axis, which is fastened to the telescope axis of the transit instrument. The telescope called the "Solar Telescope" can thus be moved in altitude and azimuth. Two pointers attached to the telescope to approximately set the instrument are so adjusted that when the shadow of the one is thrown on the other, the sun will appear in the field of view. The attachment can also be used as a vertical sighting telescope.

DIRECTIONS FOR USING THE ATTACHMENT

First. Take the declination of the sun as given in the Nautical Almanac for the given day and correct it for refraction and hourly change. Incline the Transit Telescope until this amount is indicated by its vertical arc. If the declination of the sun is north, depress it; if south, elevate it. Without disturbing the position of the Transit Telescope, bring the solar telescope into the vertical plane of the large telescope and to a horizontal position by means of its level. The two telescopes will then form an angle which equals the amount of declination, and the inclination of the solar telescope to its polar axis will be equal to the polar distance of the sun.

Second. Without disturbing the relative position of the two telescopes, incline them and set the vernier to the co-latitude of the place.

By moving the transit and the "Solar Attachment" around their respective vertical axis, the image of the sun will be brought into the field of the solar telescope, and after accurately bisecting it the transit telescope must be in the meridian, and the compass-needle indicates its deviation at that place.

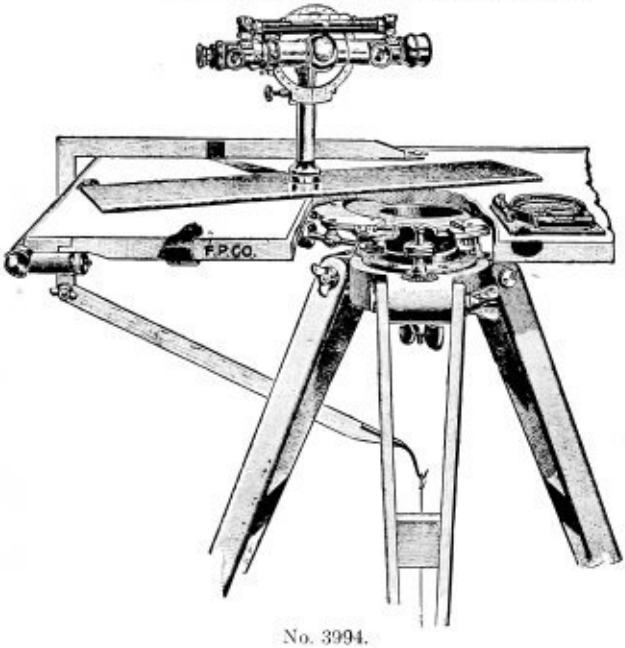
The vertical axis of the "Solar Attachment" will then point to the pole, the apparatus being in fact a small equatorial.

No. 3990. **Improved Saegmueller Solar Attachment,** as described above,
Each $50 00

SURVEYING INSTRUMENTS —Continued

THE PLANE TABLE

Plane Table with Leveling Screws and Tangent Movement



No. 3994.

No. 3994. **Improved Plane Table,** with leveling screws and tangent movement. Plan table board, 24×30 inches, mounted on large tripod with leveling socket and clamp, with plumbing bar, plummet and clamps for table, combined compass and level with square base, alidade, with telescope 11 inches long, magnifying power 24 diameters, with stadia wires, vertical circle 4½ inches in diameter, with vernier reading to one minute, with clamp and tangent screw, column with three leveling screws and tangent screw for movement in azimuth ..... Each, $170 00

EXTRAS

No. 3995. Set of 3 leveling screws to Plane Tables ..... Per set, $10 00

3996. Clamp and tangent for movement in Azimuth to Plane Tables. Each 10 00

Any other Extras required in connection with Plane Tables quoted on application

EXTRAS FOR SURVEYING INSTRUMENTS

EXTRAS TO TRANSITS

Graduation on horizontal circle, on solid silver	Each,	$10 00
Gradienter attachment	"	5 00
Stadia wires, fixed	"	3 00
Stadia wires, adjustable	"	10 00
Arrangement for offsetting at right angles	"	5 00
Variation plate	"	10 00
Gossamer water proof bag, to cover transit or level in case of rain or dust	"	1 00
Bottle of fine watch oil to lubricate the centers, etc., of transit	"	25
Quick leveling arrangement	"	10 00
Davis' Solar Attachment, all complete	"	18 00
Leather cover over case, to be strapped to the saddle of a horse	"	10 00
Reversion Level	"	10 00
Guard for Vertical Circle	"	4 00

EXTRAS TO ENGINEERS' WYE LEVELS

Center of instrument made of steel and hardened and running in a socket of cast iron	Each,	$15 00
Center of instrument made of steel and hardened	"	16 00
Stadia Wires, fixed	"	3 00
Metal-mirror with universal joint. (This is readily attachable to the instrument and facilitates the reading of the bubble on soft ground without stepping aside)	Each,	10 00
Extra Sunshade with smaller aperture, for use with the telescope when the sun's rays are too bright for accurate work	Each,	1 50
Instrument provided with three leveling screws	"	18 00
Gossamer waterproof bag, to protect the instrument in case of rain or dust.	"	1 00

EXTRAS TO LIGHT MOUNTAIN TRANSIT No. 3973

Extra side or top telescope	Each,	$30 00
Colored glass for solar observation in eye-piece slide	"	2 50
Reflector for illuminating cross hairs	"	4 00
Leather cover for case, with shoulder strap	"	8 50

EXTRAS TO MOUNTAIN AND MINING TRANSIT No. 3975

Side or Top Telescope	Each,	$30 00
5-inch Full Vertical Circle, instead of Arc	"	5 00
Offsetting Arrangement	"	5 00
Stadia Wires, fixed	"	3 00
Stadia Wires, adjustable	"	10 00
Variation Plate	"	10 00
Improved Solar Attachment, No. 3990, as described on page 368	"	50 00
Reflector for Illuminating Cross Wires	"	4 00
Aluminum Guard for Full Vertical Circle	"	4 00

PRICES FOR PARTS OF INSTRUMENTS LIABLE TO LOSS OR INJURY

FOR TRANSITS

	Each
Needle and Center Pin	$ 3 50
Ground Glass Level Vial, for plate or standard, and setting	1 00
Ground Glass Level Vial, brass mounted, complete, for plate or standard	2 00
Ground Glass Level Vial, for telescope, and setting	2 50
Cap, for eye-piece or object glass	1 00
Shade, for object glass	1 00
Clamp Screws, for horizontal limb	1 00
Tangent Screw, for leveling head	1 50
Clamp Screw, for leveling head	1 00
Leveling Screw, for leveling head	1 50
Eye Piece, complete	6 00
Object Glass, complete	6 00
Cross Wires	2 00
Cross Wires and Diaphragm	3 00
Stadia Cross Wires and Diaphragm	6 00
Adjusting Pins	10

FOR Y LEVELS

Ground Glass Level Vial, according to quality,	$2 00 to 5 00
Cap, for eye-piece or object glass	75
Clamp Screw, for leveling head	75
Tangent Screw, for leveling head,	75c to 1 50
Leveling Screw, for leveling head	1 50
Eye Piece, complete	6 00
Object Glass, complete	6 00
Cross Wires	2 00
Cross Wires and Diaphragm	3 00

FOR SURVEYORS' COMPASSES

Needle and Center Pin	3 00
Ground Glass Level Vial and setting	1 00
Ground Glass Level Vial, brass mounted, complete	1 50
Brass Cover, for compass of our make	1 50
Outkeeper	1 25
Staff Mountings, brass head (without spindle)	2 50
Staff Mountings, steel point	50
Ball Spindle, fitted	2 00
Compass Sight Vanes	2 50
Clamp Screw, for spindle or sight vane	60
Tangent Screw, for moving vernier	1 50
Staff Mountings, complete, for pocket compass	$2 50 to 4 50

MISCELLANEOUS

Steel Adjusting Pins	10
Glass Circle, for Compass face	50
Mahogany Case, with lock, key and strap, fitted complete for Transit or Level	$4 00 to 6 50
Mahogany Case, with lock, key and strap, fitted complete for Compass	$3 50 to 5 00
Regraduating Compass Circle	6 00
Regraduating Horizontal Limb and Verniers of Transit	10 00
Regraduating Vertical Limb and Verniers of Transit	5 00
Reading Microscope	75
Plumb-Bob, for Transit or Level	1 50
Rubber Hood, for Transit or Level	1 00
Chain Handles	75
Chain Tallies, Per set of nine,	75
Clamp Screw and Band, for extension leg	1 00
Leather Cases for Transits	$8 50 to 10 50

REPOLISHING INSTRUMENTS

The cost of repolishing an instrument, involving, of course, its complete readjustment, varies with the different kinds, but may be stated generally as follows:

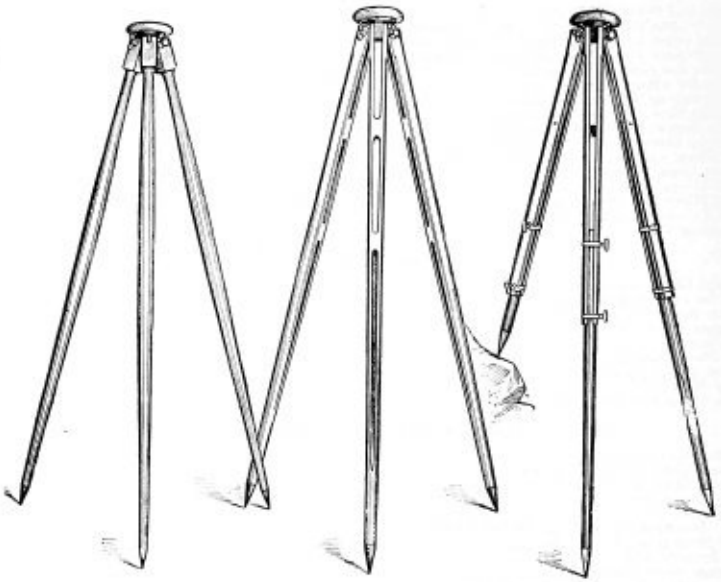
Compasses, from	$ 4 00 to $ 8 00
Transits, from	12 00 to 20 00
Levels, from	8 00 to 15 00

These prices are in addition to the cost of repairs.

No additional charge is made for bronzing or blackening an instrument when repolished.

TRIPODS

For Levels and Transits



No. 4010. No. 4012. No. 4013.

No. 4010.	Solid Leg Tripod, hardwood, for Levels and Transits	Each,	$10 00
4011.	" " " light, for Architects' Levels	"	6 00
4012.	Split Leg " " for Levels and Transits	"	12 00
4013.	Extension " " " " " "	"	15 00
4014.	" " " for light Mountain Transits	"	15 00

PARTS OF TRIPODS

No. 4015.	Solid Tripod Legs	Per set of 3, $ 6 00;	Each, $ 2 10
4016.	Split " "	" 3, 7 00;	" 2 50
4017.	Extension Tripod Legs with clamps	" 3, 10 00;	" 3 65
4018.	Tripod Heads, with bolts, for Engineers' Transit or Level		" 5 00
4019.	Wooden Cap, with brass screw plate, for tripod head		" 1 00

MAGNETIC POCKET COMPASSES

No. 4500.

No. 4502.

No. 4504.

No 4500.	Pocket Compass, Brass, watch pattern, paper dial.			
	Inches	1 3/16	1 1/8	1 1/4
	Each	$0 20	25	30
4502.	Pocket Compass, Brass, watch pattern, metal dial, stop to needle.			
	Inches	1 3/16	1 1/4	2
	Each	$0 40	45	50
4504.	Pocket Compass, Brass, watch pattern, metal dial, stop to needle.			
	Pull off cover	1 3/16	1 1/4	20
	Each	$0 50	55	60

No. 4505.

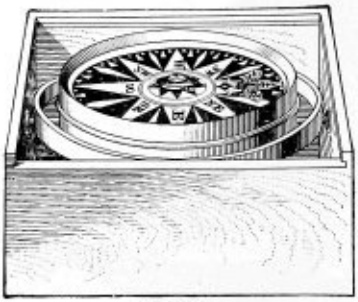
No. 4505.	Fine Watch Pattern Compass, nickel-plated hunting case, edge-bar needle, with stop, metal dial, 1 1/2 inches, Jewel center	Each, $3 00
4506.	Same as No. 4505, but 1 3/4 inches	" 3 25
4507.	Same as No. 4505, but with Singer's card dial, 1 1/4 inches	" 2 65
4508.	Same as No. 4505, but 1 1/2 inches	" 3 00
4509.	Same as No. 4508, but with Singer's aluminum dial, 1 1/2 inches	" 4 65

MAGNETIC POCKET COMPASSES —Continued

No. 4520.

No. 4520. Mariner's Pocket Compass, 2-inch, nickel hunting case, watch pattern, compass suspended in nickel plated gimbals in telescoping frame, with aluminum float, Singer dial with stop.....Each, $7 60

BOAT COMPASSES



No. 4524.

No. 4524. Boat Compasses in ash wood boxes with sliding lids, card dials, needles mounted with agate centers.

Inches, box measure	4	5	6	7	8	9	10
Each	$3 60	4 50	5 40	6 30	7 20	8 10	9 00

4525. Boat Compasses in mahogany boxes with sliding lids, card dials, needles mounted with agate centers.

Size, in inches	4	5	6	7	8
Each	$5 00	5 50	6 50	7 75	9 25

SURVEYING COMPASSES

No. 4540.

No. 4543.

No. 4549.

		Each
No. 4540.	Surveying Compass, with folding sights ending in hooks, graduated to 1 degree, needle 2 in., in mahogany case	$ 6 00
4541.	Same as No. 4540, needle 2½ inch, in mahogany case	7 00
4542.	Same as No. 4540, needle 2½ inch, in mahogany case	8 00
4543.	Surveying Compass, with folding sights graduated to 1 degree, with ball joint and socket for Jacobstaff mounting, needle 2½ in., in mahogany case	10 00
4544.	Same as No. 4543, needle 3½ inch, in mahogany case	12 00
4545.	Surveying Compass, with folding sights graduated to 1 degree, with two bubbles, ball joint and socket for Jacobstaff mounting, needle 2½ in., in mahogany case	13 50
4546.	Same as No. 4545, needle 3½ inch, in mahogany case	14 50
No. 4547.	Same as No. 4545, needle 4⅛ in., in mahogany case	16 00
4548.	Jacob-staff, 5 feet, iron shoe	1 00
4549.	Tripod, with Jacob-staff top for compasses, light	3 00

SURVEYING COMPASSES —Continued

SURVEYORS' VERNIER COMPASS

No. 4550.

No. 4550. **Surveyors' Compass,** with two straight levels, Jacob-staff mounting, brass cover, out-keepers, with vernier for adding and subtracting the magnetic variation of the needle, sights graduated for taking angles of elevation and depression, in mahogany box and strap for carrying.
Each $35 00

No. 4551. **Surveyors' Vernier Compass,** like No. 4550 but with 5-inch needle.
Each 40 00

4552. **Surveyors' Vernier Compass,** like No. 4550 but with 6-inch needle.
Each 45 00

SURVEYING COMPASSES —Continued

No. 4553. Surveying Compass with folding sights on revolving ring, with vernier and scale for magnetic variations, with 3½-inch bar needle, jeweled, ball-and-socket mounting for Jacob-staff, complete in mahogany case.
Each.....$25 00

No. 4554. Same as No. 4553, but with 4½-inch needle.
Each.....$30 00

No. 4553.

SIGHT COMPASSES

No. 4556.

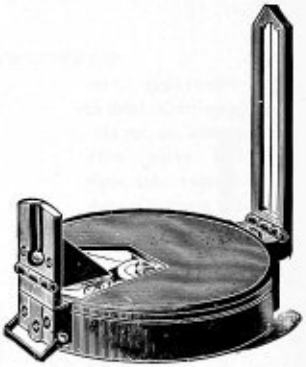
No. 4556. Sight Compass, bronze-metal case, sight in lid and folding sight, card dial, bar needle, jeweled.
Size of bar in inches 2½ 3
Each.....$7 00 $8 00

No. 4557. Same as No. 4556, with silvered-metal dial.
Size of bar in inches 2½ 3
Each.....$7 50 $9 00

No. 4558. Same as No. 4556, with raised ring for divisions.
Size of bar, in inches 2½ 3
Each.....$8 00 $10 00

PRISMATIC SURVEYING COMPASSES

No. 4560.



No. 4563.

No. 4560.	Plain Prismatic Compass, card dial, jeweled center, morocco case, 2 inches	Each,	$14 50
4561.	Same as No. 4560, 2½ inches, in sling case	"	17 50
4562.	" " 4560, 3 " " " "	"	20 50
4563.	Hutchinson's Improved, 3-inch sling case	"	19 50
4564.	" " 4 " " "	"	23 25

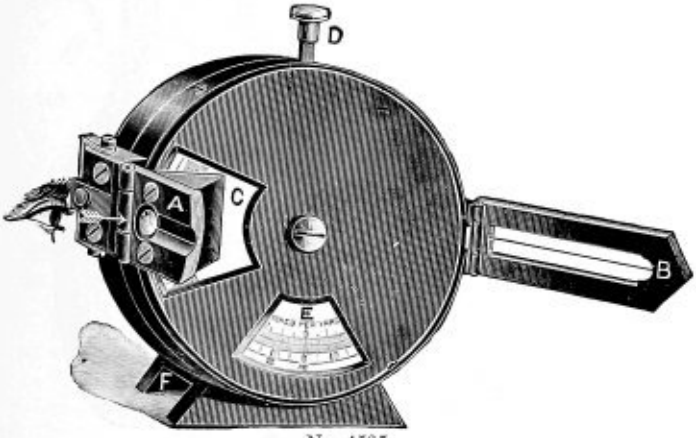
SURVEYORS' POCKET COMPASSES

No. 4564A.

No. 4564A.	Surveyors' Pocket Compass, watch pattern case, nickel-plated, with folding sights, jeweled center, needle with stop, compass 1¾ inches in diameter	Each,	$4 00
4564B.	Surveyors' Pocket Compass like No. 4564A, but compass 2 inches in diameter	"	4 50
4564C.	Surveyors' Pocket Compass like No. 4564A, but compass 2¼ inches in diameter	"	5 00

PRISMATIC SURVEYING COMPASSES —Continued

PRISMATIC COMPASS AND CLINOMETER COMBINED



No. 4565.

This instrument when used as a prismatic compass is placed in a horizontal position, the altitude and clinometer dial being fixed to the stop so that the compass divisions are rendered visible through the opening, and can be used with the prism in the usual manner. As an altitude instrument it is placed in a vertical position, as illustration, the stop being pulled up or released. The altitude arc then swings, and its divisions come into line with the prism and metal sight line. When applied as an ordinary clinometer, the readings are observed through the opening, which corresponds to the position of the clinometer base.

A is the prism box.
B is the sighting line.
C is the altitude arc.
D is the stop for locking clinometer.
E is the clinometer scale.

No. 4565. 3-inch Clinometer combined with prismatic compass, with floating card compass dial, jeweled center; clinometer scale graduated 0 to 180° with scale of rise and fall of inches per yard, folding prism and metal sight, bronzed metal case ..... Each, $34 00

4565A. 3-inch same as No. 4565, but compass fitted with aluminum ring and metal altitude clinometer dial ..... Each, 48 00

SURVEYING COMPASSES —Continued

PRISMATIC MILITARY COMPASS

No. 4566.

No. 4566. **Prismatic Military Compass,** in heavy bronzed brass box, with hinged lid, 2¼ inch diameter, with sighting glass lined in lid. The outside of case is divided every 5° with compass points to correspond. The rim holding the glass is made to revolve, for use with the direction line, which is painted on the under side of glass, for either setting the compass, or for night marching. On the right hand side of the box is a clamp for fixing this milled rim, and on the left side is a check stop. The dial is of pearl, divided and lettered with two circles of divisions. The outer circle is for use with the prism and is divided 0 to 360° in single degrees, while the inner or night marching dial, which is luminous, is divided every five degrees, and is figured and lettered in the ordinary way. The top and bottom of sight-line in lid is made luminous with darkened spots in the center, so as to enable the user to draw an imaginary line at night time when the regular sight line cannot be seen. A rubber friction ring is fitted underneath case. Complete in sole leather sling case.

Each $34 00

SIGHT COMPASS AND CLINOMETER

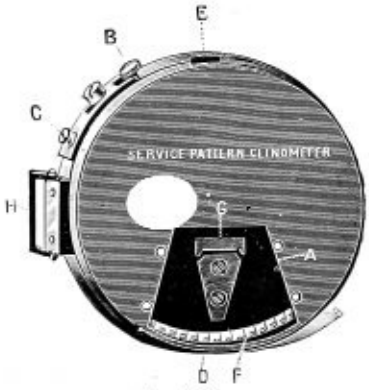
No. 4590—As Clinometer.

As Sight Compass.

No. 4590. Bronzed Sight Compass and Clinometer, metal dial, graduated to 1 degree, edge bar needle with stop. The sights are pivoted to the compass box and connected with a cross bar, which is turned down to serve as foot when the instrument is used as Clinometer. The Clinometer gives inclinations in inches per yard and in degrees. Diameter 2½ inches; in box.....Each, $8 75

4592. Same as above, diameter 3 inches; in box..... " 10 75

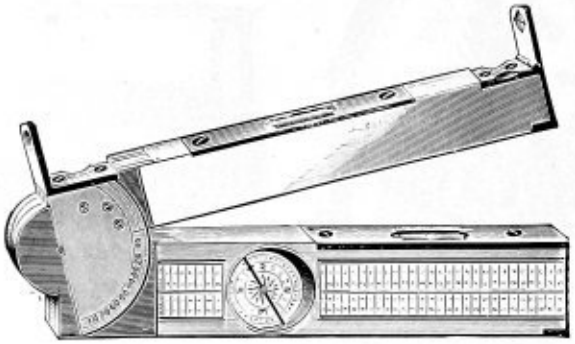
SERVICE PATTERN CLINOMETER



No. 4594.

No. 4594. This instrument is used in military operations for measuring angles of elevation or depression. It is also of great service in the question of transport of guns and stores, as by the knowledge of the dip or rise in a hill, the officer will know whether he has sufficient horsepower to draw the load and can regulate that before starting.....Each, $21 50

BOXWOOD CLINOMETERS



No. 4601.

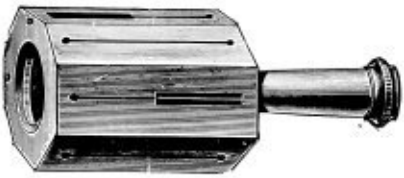
This is an exceedingly useful instrument for ascertaining the height of any object at a known distance from the point of observation. The compass fitted into the rule is useful for taking bearings of objects, and in the best form is made with a swing action to enable it to be used in conjunction with the sights.

4600. **Pocket Clinometer,** boxwood, brass mounts, with one spirit level, bar-needle compass, without sights, in leather case.....Each, $11 50

4601. Same as No. 4600, with sights and two spirit levels..... " 16 50

4602. **Pocket Clinometer,** best form, with flush vernier, engine divided, two sights and with swing compass, in leather case.. " 23 00

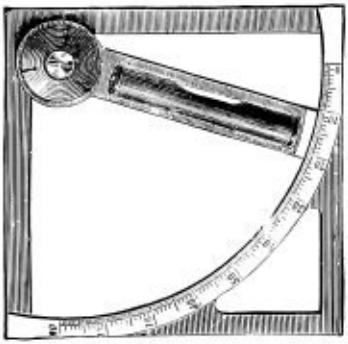
CROSS STAFF HEADS



No. 5095.

		Each
No. 5095.	Cross Staff Heads (octagon), with staff socket, in case, 2¼ inches	$3 00
5096.	Same as No. 5095, in case, 2½ inches	3 25
5097.	" " 5095, " 3 "	3 70

CLINOMETER OR SLOPE LEVEL



No. 5100.

		Each
No. 5100.	Clinometer or Slope Level, lacquered brass, with bubble mounted on limb, traversing 9-inch folding arc of 90°; in box	$11 00
5101.	Clinometer, lacquered brass, square frame, with bubble mounted on limb, traversing inscribed 4-inch arc of 90°; such design lending great stability to the instrument, and rendering the measurement of the inclination of the underside of a plane available, as any of the four edges may be used. In box	$12 00

MINERS' COMPASS AND PLUMMET LAMP

No. 5150.

No. 5153.

No. 5150. Miners' Compass, for tracing iron ore. This consists of a dipping needle 2½ inches long, mounted in brass ring graduated 0° to 180° in each direction, and having plate-glass top and bottom. When used for tracing ore, the prospector should hold the ring in his hand and keep the needle north and south, standing with his face to the west; in case.....Each, $12 00

5152. Meridian Finder, or Miners' Compass, 3½ inches in diameter. The advantage of this compass is that the needle has a motion in azimuth as well as in altitude, thus insuring the needle finding its true meridian. Also that the needle is suspended in such a way that it turns easily with nothing to impede its revolution; by this means you have perfect test in reversing the needle. Another advantage is that the needle is and can be made more sensitive than other needles of this kind; in case.....Each, 18 00

5153. Plummet lamp, of brass, 20-ounce steel point..... " 10 00

5154. Box with shoulder straps for plummet lamp..... " 4 00

ANGLE MIRRORS AND PRISMS

No. 5220.

No. 5222.

No. 5225.

No. 5227.

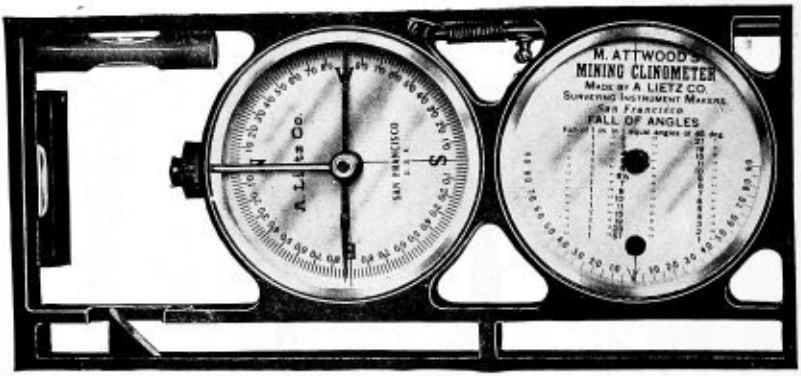
No. 5220. Angle Mirror, with small plumb bob, with attached handle which can be stored in frame of instrument. Size $3\frac{1}{4} \times 2 \times 1\frac{1}{4}$ ..... Each, $ 7 50

5222. Angle Mirror, plain, for angles of 90 degrees, in morocco case. " 5 00

5225. Rectangular Prisms, for angle of 90 degrees, $2\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{8}$ inches, in morocco case..... " 5 00

5227. Double Prism, to take angles of 90 and 45 degrees, in morocco case..... " 10 00

POCKET OMNIMETER



No. 5270.

No. 5270. **New Metal Pocket Omnimeter.** This little instrument combines a compass, Attwood Clinometer, hand level, alidade, contact level and plumb. The instrument is especially constructed for the use of miners, to take the underlay of any metalliferous vein or stratum of rock, or seam of coal. The timbering of any level, shaft or incline may be set by it. These instruments are used largely in our own as well as foreign mining districts and have given general satisfaction. Compass 2 inches in diameter, graduated to 2 degrees, numbered in quadrants at every 10 degrees. Needle with jewelled center and stop, clinometer two inches in diameter, graduated to two degrees and to slopes in feet, per 100 feet horizontal. The spirit level is as sensitive as is permissible in a hand level.

In sewed leather case.....Each, $18 00

THE "BRUNTON" PATENT POCKET TRANSIT

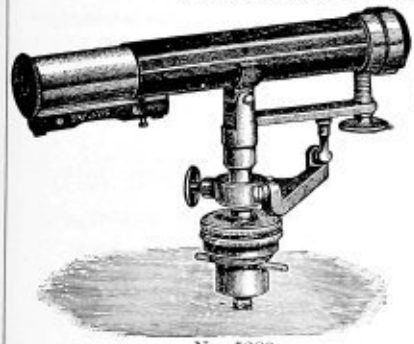
No. 5275.

A complete, accurate and reliable pocket instrument for the taking of topography and preliminary surveys of every description, either on the surface or underground; thus taking the place of a sighting compass, clinometer, prismatic compass and Abney level, and combining them as it does in one light and handy instrument.

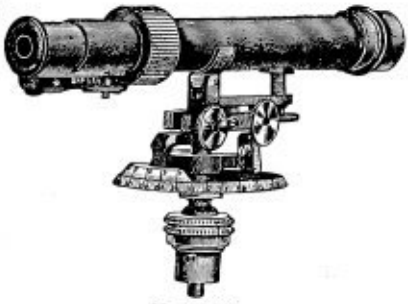
The case is made of aluminum, $2\frac{1}{4} \times 2\frac{1}{4} \times 1$ inch. Weight of instrument, about 8 ounces.

No. 5275. Brunton Patent Pocket Transit, with directions ..... Each, $25 00

REFLECTING POCKET LEVELS



No. 5280.



No. 5282.

No. 5280.	Reflecting Pocket Level with telescope of 5 diameters, ball and socket joint for Jacob staff, in case	Each,	$15 00
5281.	Reflecting Pocket Level with telescope of 5 diameters, having micrometer screw adjustment for focusing, ball and socket joint for Jacob staff, in case	"	18 00
5282.	Reflecting Pocket Level with telescope of 5 diameters, having micrometer screw adjustment for focusing, horizontal circle 3-inch diameter for offsetting, with tangent screw and vernier reading to minutes, ball and socket joint for Jacob staff, in case	"	25 00

VERSCHOYLE POCKET TRANSIT

No. 5286

IN ALUMINUM BODY

This instrument combines the useful features of Abney Level, Prismatic Compass, and Clinometer. Designed by a mining engineer of practical experience in the use and possible application of the various forms of instruments intended for preliminary survey.

The distinguishing feature of the instrument is that, owing to its novel construction, only one observation is necessary to obtain both the magnetic bearing and the vertical angle of any distant point. It is also specially adapted for use in difficult positions, such as are always liable to occur in filling in the rougher details in a mining survey. For rapid topographical work and working in constrained positions, the fact that half the labor is saved should be of interest to those who have to use this class of instrument.

Another important point is that its efficiency is not determined by the length of the diameter of the compass, as is the case with the ordinary prismatic compass. With even a small instrument the same length of sight is obtained as would be obtained with a 6- or 7-inch prismatic compass.

As a thoroughly serviceable instrument it is worthy of special notice.

It is not a complicated delicate instrument liable to derangement or deterioration.

There are no reflectors or mirrors used other than the prism, which is protected and fastened in a secure manner.

No. 5286½

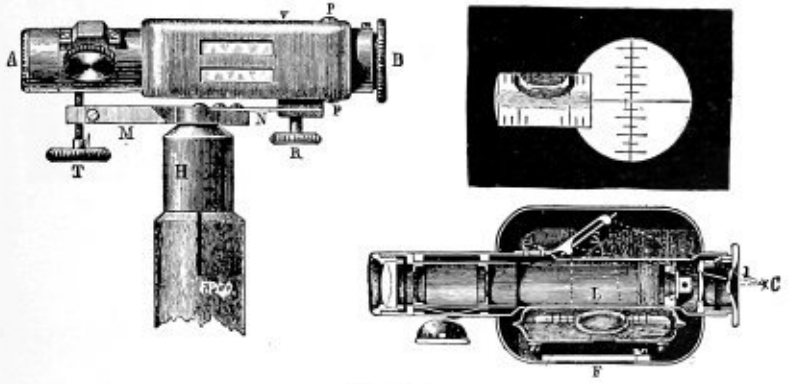
Weight of instrument	9 ozs.
Length	4½ in.
Width	3⅝ in.
Depth	11-13 in.
Length of sight arm when opened	5½ in.
Length of needle	2¾ in.

No. 5286. Verschoyle transit for hand use in sling leather case ..... Each, $35 00

No. 5286½. Same as No. 5286, but with angle piece and collapsible metal tripod, ball and socket fitting ..... Each, $44 00

POCKET LEVELING INSTRUMENT

WITH REVERSION LEVEL



No. 5287.

No. 5257. Pocket Leveling Instrument with Reflecting Level, for the use of engineers in reconnoissance work and filling in topographical details; capable of close results. The instrument is fitted with a reversion level and has compared with other designs, a striding level, the important advantage being that it dispenses with the inconvenience of adjusting the level, also with the reversing of the telescope in its wyes.

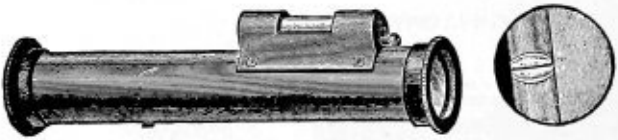
The telescope magnifies 12 times; its definition is such, that less than one-half of an inch can be read off at a distance of 300 feet. The degree of accuracy is 1-20,000 of the distance.

The reversion level is encased and protected from external influences; the bubble is directly visible in the field of the eye-piece; the whole is mounted on a light tripod with a ball and socket joint.

This instrument, which is intended for accurate measurements, can be used without preliminary adjustment. The manipulation is very simple, and is done thus: Set up the instrument with the level on the left and take a reading; unscrew the milled-headed screw by which it is fastened to the horizontal bar carrying the micrometer screw, turn the instrument upside down with the level on right and fasten in place; take another reading and the arithmetical mean is the correct value.

Complete, in case.....Each, $42 00

HAND LEVELS



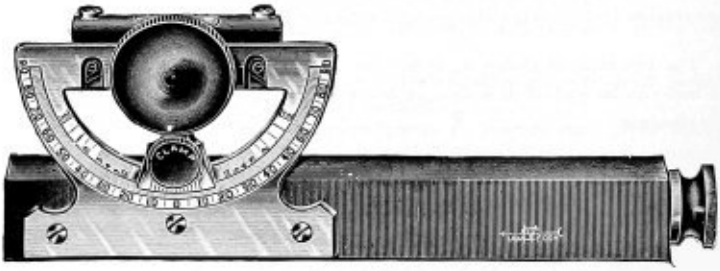
No. 5290.

No. 5288.	Locke's Hand Level,	brass, nickel-plated, in case, 5 inches	Each,	$6	00
5290	" " "	bronzed, in case, 5 inches	"	5	00
5292.	" " "	German Silver, in case, 5 inches	"	7	50

No. 5293.

No. 5293. Hand Level, square tube, bronzed, 5 inches ..... Each, $4 50

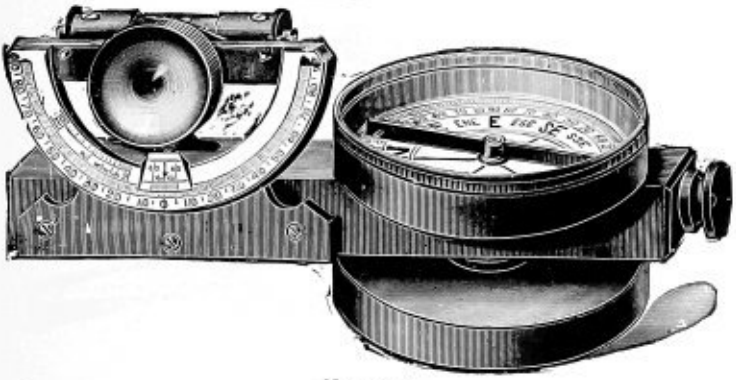
ABNEY'S HAND LEVELS



No. 5295.

No. 5295. Abney's Reflecting Level or Pocket Altimeter, square bronzed sighting tube, 5 inches, with vertical arc, 1 inch, graduated to 60 degrees in each direction to single degrees, with folding vernier reading to 5 minutes. Scale of grades from 1:1 to 1:10. Spirit level, in leather pocket case ..... Each, $13 50

ABNEY'S HAND LEVELS —Continued

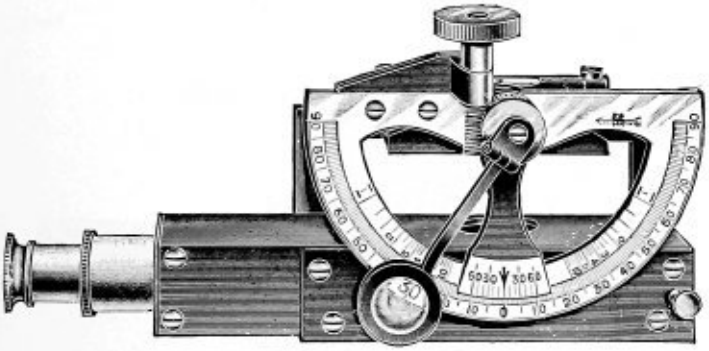


No. 5297.

No. 5297. Abney's Reflecting Level or Pocket Altimeter, 5 inches, with divided arc to show angles and with bar needle compass, and socket for Jacob staff, in hand sewed case.....Each, $20 00

This instrument will be found very useful for all operations where inclination of surface and angular distance is needed.

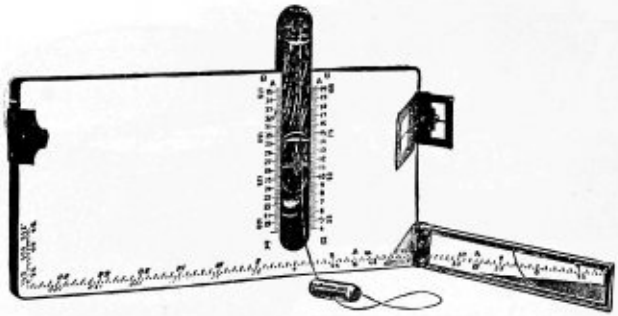
SERVICE PATTERN ABNEY LEVEL



No. 5299.

No. 5299. Improved Abney Level with rack action. This Abney level has an extra large arc divided 0° to 90° each way, with vernier reading to 10 minutes, and a **double** draw telescope. Double reading grade scale. Length, when closed, 4 inches. Length, when opened, 7 inches. Weight, 6¼ ozs. The above level is the "Service Pattern Level" of the British Army. By the rack and pinion adjustment, it can be very delicately and easily adjusted, and has the advantage of being compact and portable. In leather sling case.....Each, $40 00

HYPSOMETER CLINOMETER



No. 5310.

No. 5310. Hysopmeter Clinometer (Faustman), 7 inches by 3½ inches, of polished hardwood, improved construction, graduated on white face, with doling sight and hinged mirror, with scale of heights on base of groove for slide. Plumb bob cord fastens to slide, provided with two reading lights corresponding with the two angles of distance. In pocket case, with directions.....Each, $6 50

ARTIFICIAL HORIZON

No. 5311.

No. 5311. Mercurial Horizon, as used by United States Navy, bronzed brass roof, 3¾×7¼×4½ inches high, fine plane glass 2⅞×4⅛ inches, iron mercury trough, with thread for funnel and lid, iron mercury bottle with threaded stopper and funneled top, in polished mahogany case and carrying strap. Complete with mercury.....Each, $35 00

SUN DIALS

No. 5320.

No. 5320. Sun Dial with two levels and adjusting screws, divided and engraved for North and South latitudes, complete in morocco case.

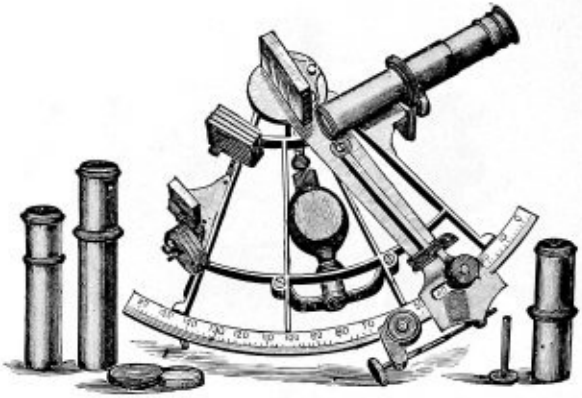
	Size, in inches,	2½	3½
Each		$35 00	53 00

POCKET SEXTANT

No. 5321.

No. 5321.	Pocket Sextant, best made, divided on silver, with telescope, in morocco case	Each,	$62 50
5322.	Same as No. 5321, without telescope	"	57 50
5324.	Same as No. 5322, with leather sling case	"	60 00

SEXTANTS AND OCTANTS



No. 5330.

No. 5330.	Sextant, of gun-metal, 4½ inches radius, arc of 150 degrees graduated on silver to 15 minutes, with vernier to 15 seconds, clamp and tangent and magnifier, one terrestrial telescope, one celestial telescope, one sight-tube, six neutral glasses, two mirrors, in mahogany box.	Each,	$60 00
5331.	Sextant, of gun-metal, superior, 7 inches radius, arc of 150 degrees graduated on silver to 10 minutes, with vernier to 10 seconds, clamp and tangent and magnifier, two celestial telescopes, one terrestrial telescope, one sight-tube, seven neutral glasses, two mirrors, in mahogany box	Each,	120 00
5332.	Octant, of gun-metal, as made by us for U. S. Navy, measuring angles up to 100 degrees. Graduations on inlaid silver to 20 minutes, vernier reading to 30 seconds, magnifying glass, clamp and tangent screw to vernier, 1 sighting tube, 1 star telescope, 7 neutral glasses to octant, 2 neutral glasses for telescope, 1 each spare index and horizon mirror. Instrument complete with two screw-drivers, in polished mahogany case, with lock and key	Each,	80 00
5333.	Index Mirrors for Mariner's Quadrant, Sextant, etc	"	1 00
5334.	Horizon Glass for Mariner's Quadrant, Sextant, etc	"	75
5335.	Screen Glass, light, medium, and dark green or red	"	50
5336.	Star Telescope	"	6 00
5337.	Micrometer Reader	"	3 00
5338.	Extra Eyepieces	"	5 00

PEDOMETERS, PACEOMETERS AND ODOMETERS

No. 5375.

No. 5376.

No. 5375. Pedometer, nickel case, registering distances walked to 10 miles.
Each $1 00

5376. Pedometer, nickel case, registering distances walked to 100 miles.
Each 1 50

5380. Paceometer, watch pattern, nickel case, registering to 100,000 steps.
Each 6 50

No. 5385.

No. 5385. Odometer, in metal case, with metal dial, with leather case and straps.
Each $15 00

Can be attached to any carriage without injury to the wheel and removed at pleasure.

The circumference of the wheel being given, the distance can be obtained by multiplying it by the number of revolutions recorded on the dial.

IMPROVED BELL ODOMETER

No. 5390.

No. 5392.

No. 5390. Improved Bell Odometer, registering miles and 40th miles....Each, $5 00
5392. " " " " revolutions..... " 6 00

The Bell Odometer is designed to register the distance traveled by vehicles of every description, and rings a small bell as each mile is passed. Keeps a record for 1,000 miles and repeats. It is fastened to the axle and is operated by a steel pin driven in the end of the hub, or by a special attachment furnished for wire wheel. These attachments propel the mechanism of the Odometer with each revolution of vehicle wheel.

When a mile has been passed the fact is distinctly announced by one sharp stroke of a small bell in the Odometer. With this exception, the instrument is absolutely noiseless.

Every Odometer is fully warranted. Any instrument that may prove defective in material or construction will be replaced free of charge. Every part is made in duplicate, so that if worn or broken it can be replaced at a trifling expense.

Made for wheels of any size from 26 to 60 inches, diameter varying every half inch. In sending orders it is necessary to send the exact diameter of the rear wheel of carriage. Explicit instructions, record cards, and steel pin are sent with each instrument.

ANEROID BAROMETERS

For Measuring Heights and Atmospheric Pressure

Aneroid Barometers are used for measuring heights and temperature pressure. Experience of many years has shown the great merits of this form of barometer.

As a weather indicator, the Aneroid has practically superseded the Mercurial Barometer, as the former is purely mechanical it its action and cannot be easily deranged.

No. 5400.

No. 5410.

No. 5400.	Watch size, gilt case, 1¾ inches diameter, silvered metal dial, revolving altitude scale 8,000 feet, in morocco case	Each,	$13 50
5401.	Same as No. 5400, but superior quality and scale 3,000 feet, compensated for temperature, in morocco case	"	21 35
5402.	Same as No. 5401, but altitude scale 8,000 feet	"	19 25
5403.	Same as No. 5401, but altitude scale 16,000 feet	"	22 50
5410.	Watch size, gilt case, 1¾ inches diameter, silvered metal dial, altitude scale 8,000 feet, bar-needle compass on reverse (to detach), compensated for temperature, in morocco case	"	30 00
5411.	Same as No. 5410, but altitude scale 6,000 feet	"	32 50
5412.	Watch form Aneroid silver metal dial, Hunter form case with revolving altitude scale 8,000 feet, compensated for temperature	"	21 25

ANEROID BAROMETERS —Continued

POCKET SIZE ANEROIDS WITH SILVERED METAL DIAL

No. 5415.

No. 5415. 2½ inches in diameter with silvered metal dial, in gilt case, compensated for temperature, in morocco case, with revolving altitude scale 8,000 feet.....Each, $20 50

5416. Like No. 5415, but altitude scale 3,000 feet..... " 22 60

5419. Like No. 5415, but altitude scale 16,000 feet..... " 23 80

5420. Like No. 5415, but altitude scale 20,000 feet..... " 25 50

ANEROID BAROMETERS —Continued

For Measuring Heights and Atmospheric Pressure

No. 5425.

No. 5427.

No. 5425. 3-inch stout bronzed metal case, silvered metal dial, with Vernier scale moved by rackwork motion, reading lens arranged to traverse the entire circle, altitude scale 6,000 feet, in soild leather sling case. Each $63 00

5425½. Same as No. 5425, but altitude scale 16,000 feet ..... Each, 69 40

5426. 5-inch stout bronzed metal case, silvered metal dial, with Vernier scale moved by rackwork motion, reading lens arranged to traverse the entire circle, altitude scale 6,000 feet, in solid leather sling case ..... Each, 68 00

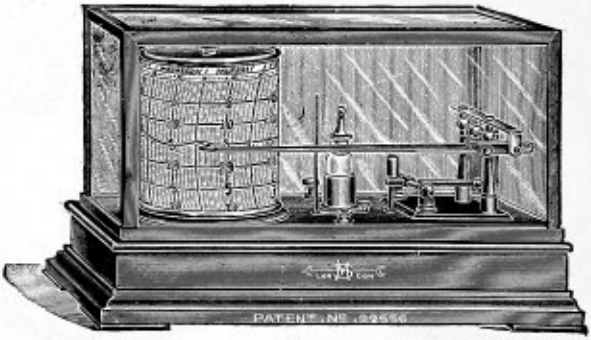
5426½. Same as No. 5426, but altitude scale 16,000 feet ..... " 74 40

5427. 3-inch stout bronzed metal case, silvered metal dial, with Vernier scale moved by rackwork motion, reading lens arranged to traverse the entire circle, altitude scale arranged for mining purposes 4,000 feet ascent, 2,000 feet descent, in sling leather case ..... Each, 63 00

5428. 5-inch stout bronzed metal case, silvered metal dial, with Vernier scale moved by rackwork motion, reading lens arranged to traverse the entire circle, altitude scale, arranged for mining purposes, 4,000 feet ascent, 2,000 feet descent, in leather sling case ..... Each, 68 00

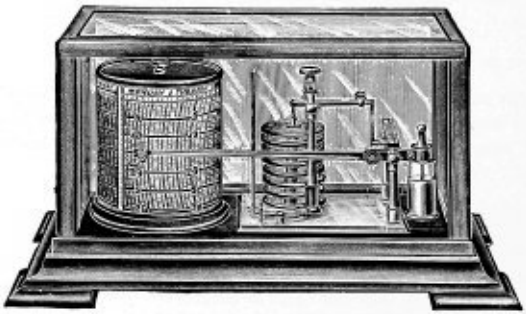
BAROGRAPHS

These instruments are constructed to record varying atmospheric and temperature conditions by means of a German silvered arbor connected at one end with the Aneroid Barometer and carrying on the other end a pen to record automatically on a revolving graduated chart, connected with an eight-day clock, thus giving the records of one week complete on one chart.



No. 5430.

No. 5430. Barograph, simplified, in oak case, with inlaid boxwood beveled plate glass, with perforated charts for one year, with pen and ink. Each.....$40 00



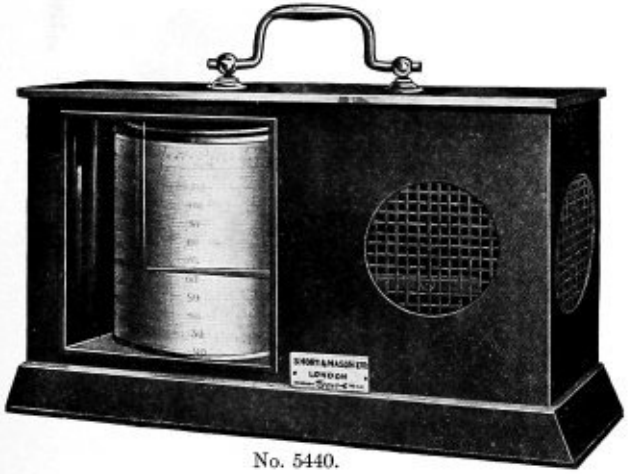
No. 5435.

No. 5435. Barograph, wood frame, glass case, front opening door, complete with perforated charts for one year, pen and ink .. . . . .Each, $53 00

No. 5436. Extra charts for above, one year's supply.....Per set, 2 50

RECORDING THERMOMETERS

8-DAY CLOCK



No. 5440.

The Thermograph (recording thermometer), is so arranged that by means of a pen upon a chart it creates a continuous seven day record both of time and temperature.

The chart is divided vertically in days and hourly subdivisions of each day, while horizontally the dividing lines are in degrees of temperature.

Mounted upon a revolving drum operated by self-contained clock movement, the chart makes a complete revolution in seven days.

The arm carrying pen is connected directly with a bimetallic coil or lamina, which, by means of the unequal expansion and contraction of its two metals, opens and closes as the temperature changes, causing the arm with the pen to move vertically.

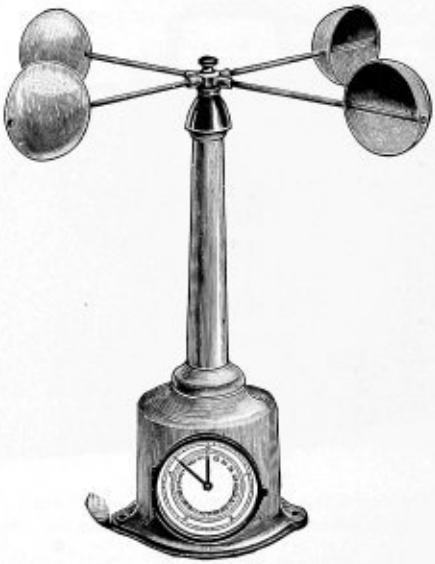
The pen at end of arm filled with specially prepared ink rests against the chart and creates the record.

The charts run for seven days and, when removed, may be pasted together, making a continuous temperature record from the time the thermograph was first started.

No. 5440. Low Drum Clock as illustrated, ranges 0 to 100° Fahrenheit, 20° to 120° Fahrenheit, 60° to 200° Fahrenheit, 0 to 50° Fahrenheit, 15° below to 30° above Reaumur, 30° below to 110° above, Fahrenheit. Each $54 00

5445. High Drum Clock, range 20° below to 115° above, Fahrenheit. Each 58 00

ANEMOMETERS OR WIND GAUGES



No. 5450.

No. 5450. Robinson's Improved and Simplified Anemometer, 3-inch cups, for measuring the velocity of air-currents in mines, sewers, hospitals, public and private buildings, etc. Each instrument is tested separately, and has a correction table for variations, showing the amount of air, in feet, to be added and deducted. The four hemispherical cups are set in rotation by the motion of the air and the number of revolutions is recorded by the mechanism in the base of the instrument. The vertical axis communicating the motion of the cups to the recording mechanism runs in ball bearings, which insures a sensitive and delicate movement. The results of observations can be read off on an enameled dial on the face of the base. The outer circle of this dial registers 5 miles by $\frac{1}{10}$ mile and the inner one up to 500 miles. The two hands can be set to zero..... Each, $45 00

ANEMOMETERS OR WIND GAUGES —Continued

No. 5460.

No. 5460. Portable Airmeter, 4 dials reading to 100,000 feet, zero setting. Each $30 00

No. 5467

No. 5465. Biram's Anemometer, 3 inches, 2 dials reading to 1,000 feet, leather case. Each 25 00

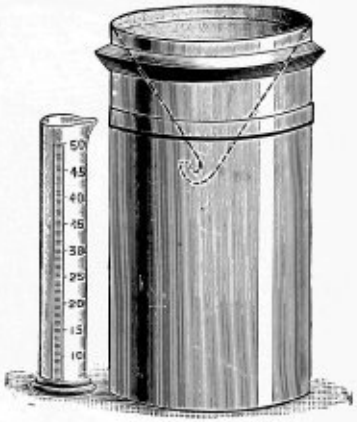
5467. Biram's Anemometer, 4 inches, 4 dials reading to 100,000 feet, leather case. Each 28 00

5469. Biram's Anemometer, pocket size, 2 dials reading to 1,000 feet, in morocco snap case .... Each, 40 00

RAIN GAUGES

No. 5480.

Howard's Pattern Gauge



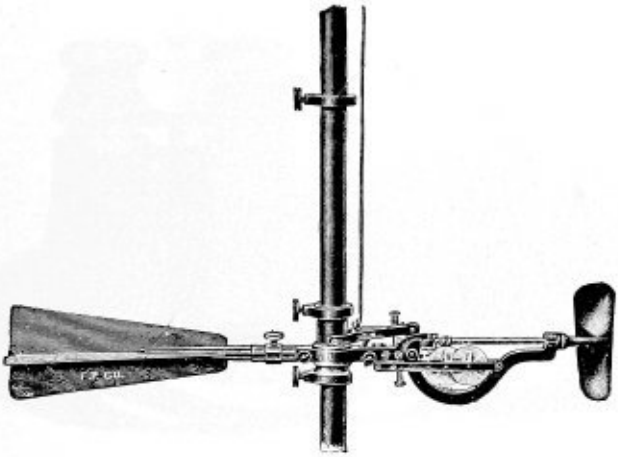
No. 5481.

Glaisher's Pattern Gauge

No. 5480. Howard's Gauge, comprising glass bottle with japanned funnel with brass rim, 5 inches diameter, graduated glass measure to show $\frac{1}{100}$ inch of rainfall.....Each, $3 25

5481. Glaisher's Gauge, comprising a metal receiver with funnel 8 inches diameter, brass rim, terminating in a curved tube, which, retaining small portion of water, prevents evaporation. The receiver being sunk into the ground to within 8 inches of the top, no evaporation will take place even in the warmest seasons.....Each, 7 50

CURRENT METER



No. 5495.

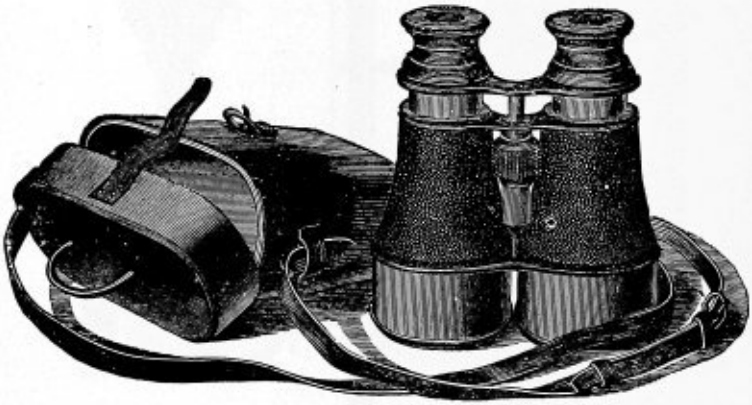
No. 5495. Current Meter for mechanical registering in connection with electrical contact for every 100 revolutions with two graduated wheels registering to 1,000 revolutions; the metal rudder is provided with 4 blades, 8½ inches long and 4 inches in diameter continuously engaging and disengaging the mechanism to registering wheels, with pulley over top of pole for raising and lowering the instrument; sights for determining the direction of the instrument and two first quality dry cells. The instrument can be used on a pole of about 1 inch diameter; can be taken apart and placed very compactly in a polished hardwood case. Complete..... Each, $135 00

FIELD OR MARINE GLASSES

"Lemaire" (Paris) Brand

U. S. Signal Day and Night Glasses, adopted by the U. S. Government.

Arched Cross Bars with Sun Shades



No. 5500.

THE STANDARD

These glasses are supplied with lenses which have never been equaled in definition, so constructed to meet the requirements of long range purposes, the frame work being strong and not liable to get out of adjustment.

No. 5500. Field or Marine Glasses, Black Morocco, Stitched, Oxidized Cross Bars, Slides and Sun Shades, Sole Leather Case, with Strap.

Lignes	21	24	26
Each	$15 00	$18 00	$20 00

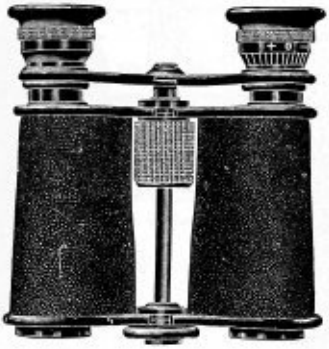
5510. Field or Marine Glasses, 12 Lenses, Black Morocco, Oxidized Cross Bars, Slides and Sun Shades, same as No. 5500, the best Glasses in the market; 26 Lignes, Sole Leather Case, with Strap.....Each, $35 00

5515. Field or Marine Glasses, Bright Aluminum, Metal Body, Russia Leather Covered, with Sun Shades, Sole Leather Case, with Strap.

Lignes	19	21	24	26
Each	$25 00	$30 00	$35 00	$40 00

STEREO BINOCULARS

HIGHEST QUALITY



No. 5520.

Bausch & Lomb Binoculars, **five-and-one-half power** for general field work races, hunting, games; **eight-power,** the most popular prism binocular; **ten-and-one-half power,** the smallest high-power binocular

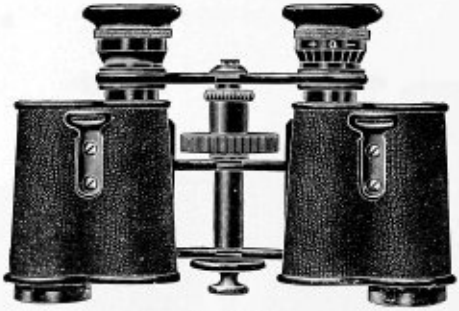
BINOCULARS WITH FOCUSING ATTACHMENT

No. 5520.	Prism	5½,	magnifying power	5½	.....	Each,	$40 00
5521.	"	8,	"	" 8	.....	"	40 00
5522.	"	10½,	"	" 10½	.....	"	50 00

Stereo alone surpasses it, and that only in stereoscopic effect

STEREO BINOCULARS

HIGHEST QUALITY



No. 5550.

Four-Power.—This glass is the most compact of the series and has the largest field.

Five-Power, Night Marine Glass.—The lenses and prisms are extra large and enable one to see when the light is too faint to use the ordinary glass. It gives excellent results for studying birds and living animals in the shadows of trees and foliage.

Six-Power.—For general field work, races, games, hunting, yachting, etc. It is sufficiently powerful for all ordinary purposes.

Seven-and-One-Half Power, Night Marine Glass.—The highest practical power for a night glass. It gives marvelously brilliant results as a general field glass for day use.

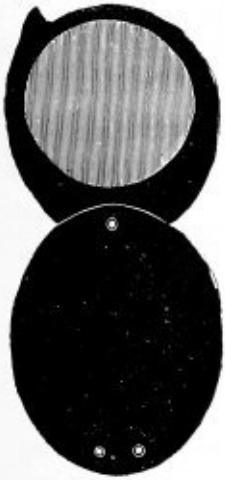
Eight-Power.—This is the most generally useful glass for field, military, yachting, touring, racing and similar purposes.

Ten-Power, Day Marine Glass.—This glass is superior in illumination to the eight-power and is especially suitable for observations where very great distances are to be covered.

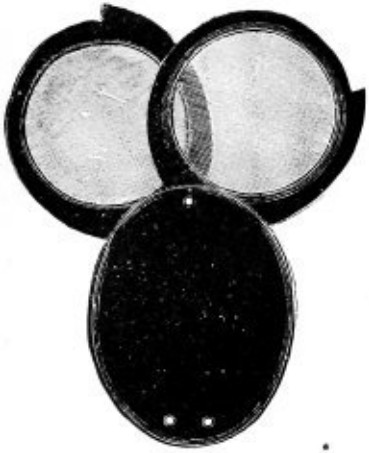
				Price of Binoculars without focusing attachment	Price of Binoculars with focusing attachment
No. 5550.	Stereo	4, magnifying power	4	Each, $40 00	
5551.	"	5, " "	5	" 63 50	$66 00
5552.	"	6, " "	6	" 43 50	46 00
5553.	"	7½ " "	7½	" 63 50	66 00
5554.	"	8, " "	8	" 47 50	50 00
5555.	"	10, " "	10	" 67 50	70 00
5556.	"	12, " "	12	" 67 50	**70 00**

POCKET MAGNIFIERS

BEST QUALITY

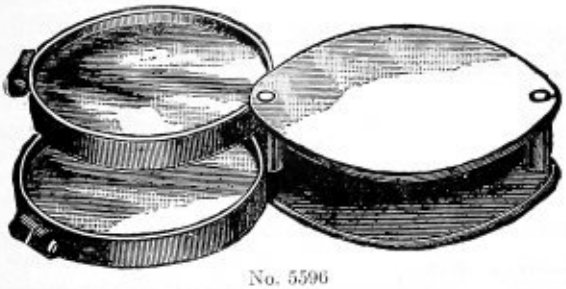


No. 5575.



No. 5585.

No. 5575.	Mounted in rubber,	1	lens,	1	-inch diameter			Each,	$0 35
5580.	"	"		1	"	1½	"	"	55
5585.	"	"		2	"	1	"	"	60
5590.	"	"		2	"	1½	"	"	1 00



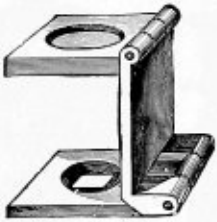
No. 5596

No. 5595.	Mounted in metal, nickel-plated,			1	lens,	1	-inch diameter	Each,	$0 75
5596.	"	"	"	2	"	1	"	"	1 00
5597.	"	"	"	3	"	1	"	"	1 30

MAGNIFYING GLASSES

FINEST QUALITY

No. 5700.



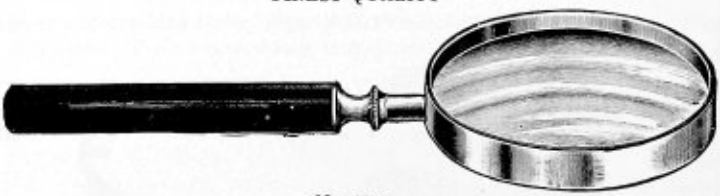
No. 5710.

No. 5715.

No. 5700.	Coddington Lens, metal folding frame, nickel-plated ¾-in. diam.	Each,	$1 50
5702.	" " " " " " 1 "	"	2 10
5704.	" " " " " " 1⅜ "	"	3 60
5710.	Thread Counter, brass frame, ½-inch field	"	40
5715.	Magnifier, on 3 legs, brass, screw adjustment, 1-inch diameter	"	60

READING AND PICTURE GLASSES

FINEST QUALITY



No. 5720.

No. 5720.	Inches	1½	2	2½	3	3½	4	4½	5
	Each	$0 55	0 75	0 95	1 30	1 75	2 35	3 00	3 75

5721.	Reducing Glasses.		
	Inches	2	3
	Each	$1 10	1 80

These Reading and Picture Glasses are of superior magnifying power, and mounted in round nickel-plated frame, with ebony handles.

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